

MANUFACTURERS' RECORD

A Weekly Southern Industrial and Hardware Newspaper.

VOL. 10. No. 22.
WEEKLY.

BALTIMORE, JANUARY 8, 1887.

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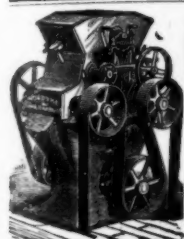
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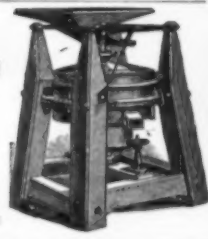
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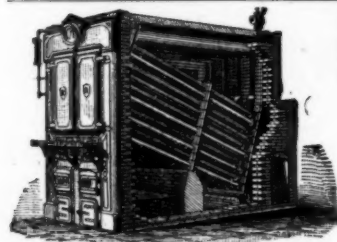
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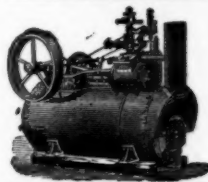
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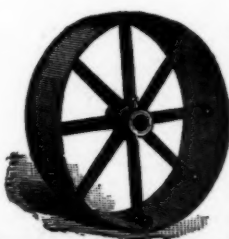


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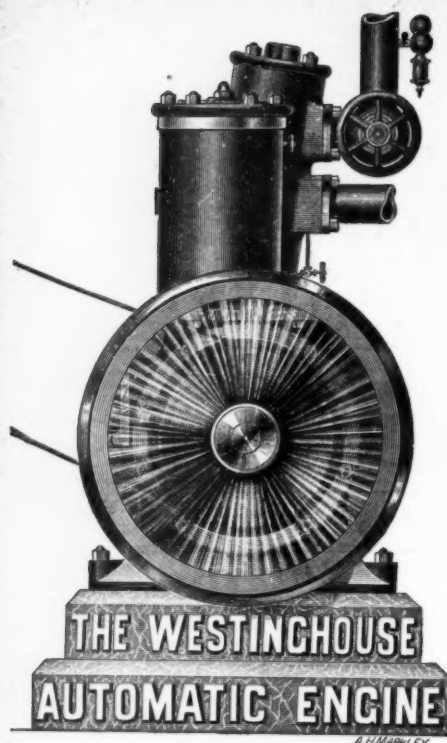
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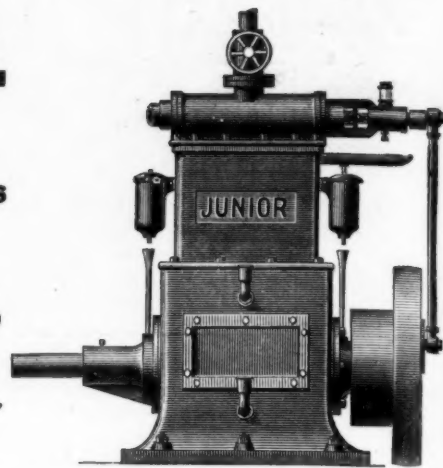
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ROBERT MIDDLETON.....Mobile, Ala.
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Sales List for November, 1886.

South Side Electric Light Co.....	Pittsburgh, Pa.,	H. P.	Brainard & Shephard.....	Alabany, N. Y.,	H. P.
" " " ".....	" "	150	Henry Warden.....	Philadelphia, Pa.,	25
Union Switch & Signal Co.....	" "	75	Crown Mills.....	Marcellus, N. Y.,	25
East End Electric Light Co.....	" "	75	S. R. Cain.....	Bristol, Vt.,	25
" " " ".....	" "	75	Wabash, St. L. & Pacific R. R.....	Ft. Wayne, Ind.,	25
Brush Electric Light Co.....	Buffalo, N. Y.,	60	Minneapolis Gas Light Co.....	Minneapolis, Minn.,	25
McConway & Torley.....	Pittsburgh, Pa.,	60	" " " ".....	" "	25
Winona Paper Co.....	Holyoke, Mass.,	60	Thos. Henshall.....	Paterson, N. J.,	15
New York & Manhattan R. E. Co.....	New York,	60	E. Balbach & Son.....	Newark, N. J.,	15
Mather Electric Co.....	Hartford, Conn..	60	Gas Engine and Power Co.....	New York,	15
" " " ".....	" "	60	Roullaux, Dugage & Co.....	Suresnes, Fr.,	15
Jefferson City Electric Light Co....	Jefferson City, Mo.,	60	Shickle, Harrison & Howard.....	St. Louis, Mo.,	15
Wahoo Electric Light Co.....	Wahoo, Neb.,	60	McCord, Ford & Co.....	Colfax, W. T.,	15
J. C. Livingston & Co.....	Little Falls, N. Y.,	45	Decaturn Furnace Co.....	Decaturn, Ala.,	15
Weidman Silk Dyeing Co.....	Paterson, N. J.,	45	Lawrence Machine Shop.....	Lawrence, Mass.,	10
Miller, Brody & Co.....	Alexandria, La.,	45	" " " ".....	" "	10
E. L. McLain Mfg. Co.....	Greenfield, O.,	45	N. W. Wait, Son & Co.....	Sandy Hill, N. Y.,	10
Van Deventer & Horne.....	Plainfield, N. J.,	35	F. S. Cole.....	Grundy City, Ia.,	10
"The Public Ledger,".....	Philadelphia, Pa.,	35	Union Pacific R. R.....	Omaha, Neb.,	10
" " " ".....	" "	35	George C. Howard.....	Philadelphia, Pa.,	5
" " " ".....	" "	35	Merritt W. Burwell.....	New Haven, Conn.,	5
" " " ".....	" "	35	Westinghouse Electric Co.....	Pittsburgh, Pa.,	5
E. Balbach & Son.....	" "	35	Lawrence Machine Shop.....	Lawrence, Mass.,	5
Wolf & Hamaker.....	Chambersburg, Pa.,	25	" " " ".....	" "	5
Imperial Guano Co.....	Norfolk, Va.,	35	J. A. Diamond.....	Indianapolis, Ind.,	5
Chandler & Price.....	Cleveland, O.,	35	F. J. Yandle.....	Santa Rosa, Cal.,	5
Wabash, St. L. & Pacific R. R.....	Ft. Wayne, Ind.,	35	Aberdeen Packing Co.....	Astoria, Or.,	5
Barnes Bros.....	Maquoketa, Ia.,	35			
A. J. Mullen.....	Selma, Ala.,	35			
			TOTAL, 56 ENGINES.		1,975

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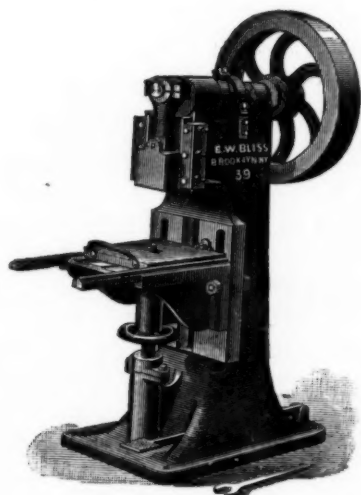
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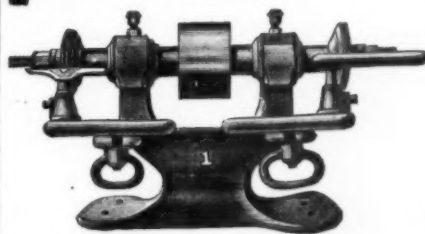
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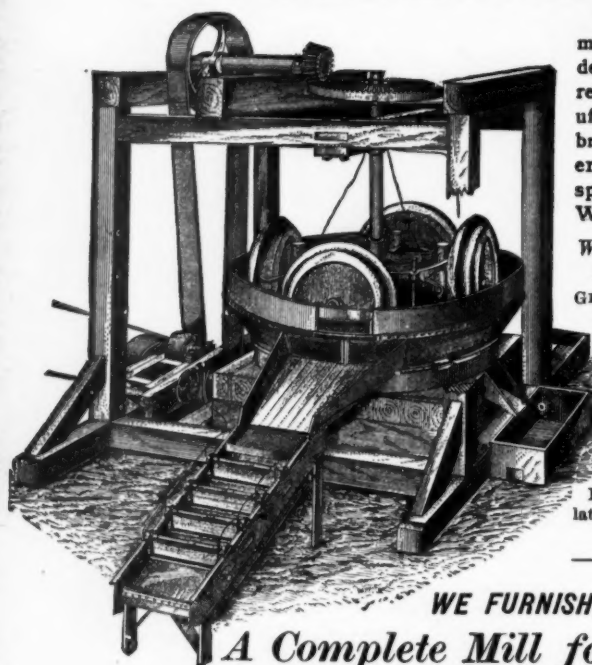
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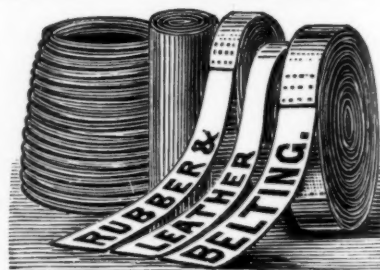
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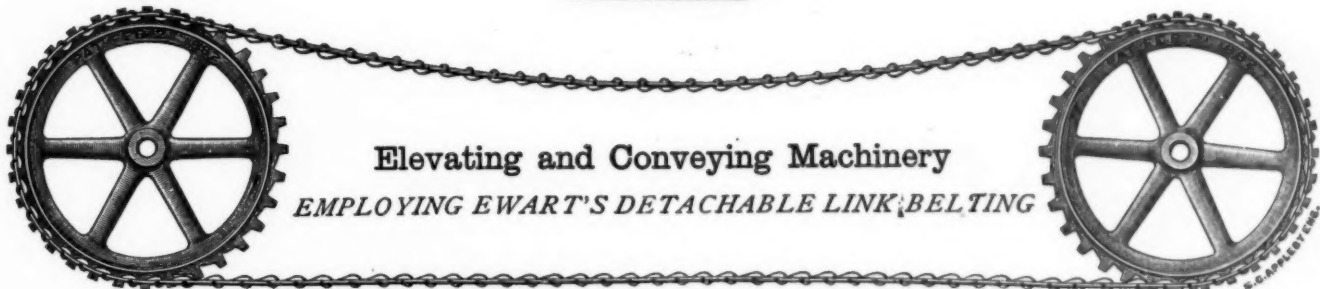
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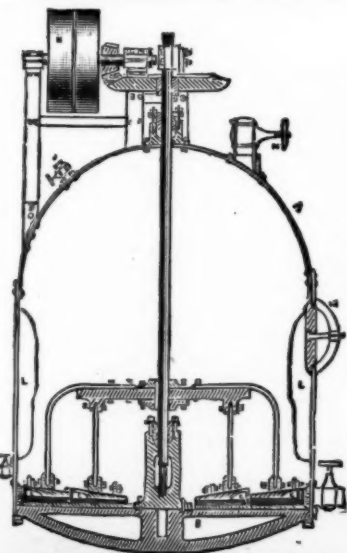
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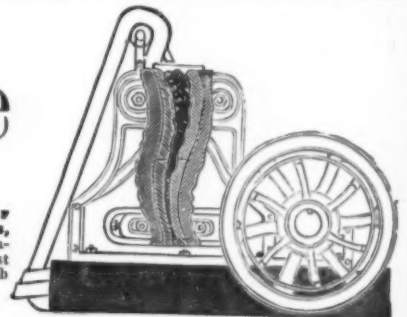
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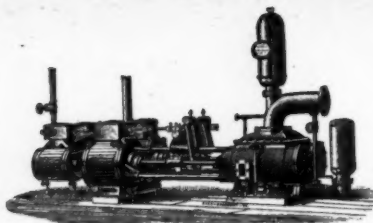
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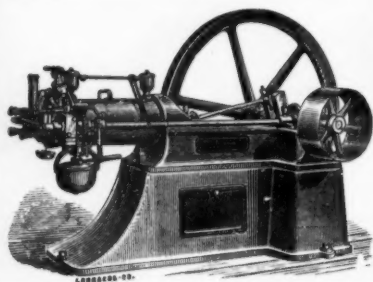
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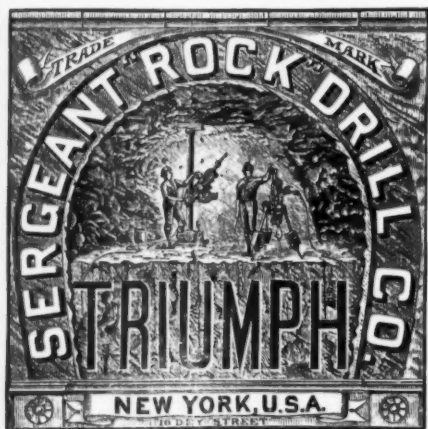
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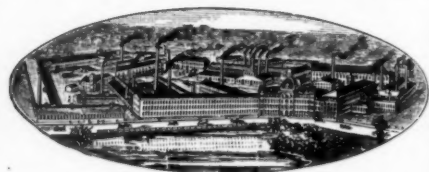
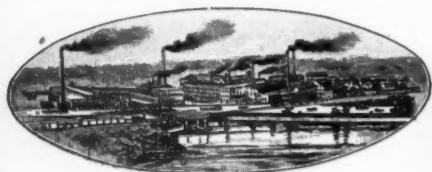
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PUBLISHED EVERY SATURDAY BY THE
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Room 6, No. 118 Fulton Street.

SUBSCRIPTION \$3.00 A YEAR.

BALTIMORE, JANUARY 8, 1887.

A Coming Industrial Center in Southwest Virginia.

The Cripple Creek district of Southwest Virginia, the mineral wealth of which is probably not surpassed anywhere in the South, is destined, as we have so often predicted, to become the seat of great iron interests. The extension of the Norfolk & Western Railroad to this section has now for the first time opened it up to the outside world, and made its development possible. We have lately reported the activity in real estate interests throughout that section, due to the purchase by Northern capitalists of extensive mineral properties there. The finest property probably in that whole region, a tract of between 2,000 and 3,000 acres, known as the Foster Falls Property, has been purchased by a syndicate of wealthy Northern men, who propose to lay the foundation for a town, which must become an important iron and lumber center. The advantages of the location are many. The country is noted for its healthfulness, the beauty of its scenery and the vastness of its timber resources as well as of iron. Passing through the property is the New River, which affords splendid water power and just at the point where needed. Moreover, one of Nature's wonders, that are so abundant through the Old Dominion, is found here and a natural dam of immense rocks is already there, doing away entirely with the necessity of building one. A fall of 20 feet with a great volume of water furnishes splendid power for running a furnace, rolling mill or other enterprises. The late owners of this property had a charcoal furnace at this point, and while, without railroad facilities for shipping the iron, this was largely counterbalanced by the abundance of ore, limestone, fuel and free power.

As our readers know, the iron ores of the Cripple Creek section are largely Bessemer ores of good quality. On the Foster Falls property the general run of ores is of a very high grade and requires only a small admixture of Bessemer to produce Bessemer pig, while some of the ores there are fine grade Bessemer ores needing no admixture. These ores of such good quality, we are posi-

tively assured on the best of testimony, and that is actual experience, can be put in the furnace at considerably less than \$1 a ton; limestone is abundant and has to be carted only two or three hundred yards, while the Pocahontas coke, the superior quality of which is generally known, has been offered laid down at the present furnace for \$2.50 a ton, and it is probable that even a lower figure than this will be secured by the new furnace to be erected there. By the present railroad route the rich Bessemer ores at Cranberry are distant about 90 miles from the Foster Falls place, and the small quantity of this ore needed to mix in making Bessemer iron could be delivered at a small cost for freight. However, one end of the Cranberry vein extends to within 12 or 14 miles of Foster Falls, and it is in contemplation to open a mine there and build the short road needed to bring this ore to Foster Falls. Here then will center rich ores, abundance of limestone and good coke, all at a low cost, and added to this, great water power without the expense even of building a dam.

The purchasers of this property, we believe, are mainly Philadelphia capitalists. They have decided to erect a large furnace there, commencing work on it quite soon, and we understand that a fine hotel, probably somewhat similar to those at Luray and Roanoke, will also be put up. With immense mineral and timber wealth, fine agricultural advantages, especially for grazing purposes, scenery that alone will draw many summer visitors, and noted healthfulness, the new town, yet to be named we suppose, ought certainly to be able to soon take a place in the list of young progressive industrial towns of the South. The MANUFACTURERS' RECORD, the first paper to learn of this proposed enterprise, and the first, of course, to give even a slight outline of its advantages, extends its best wishes for the successful building up in Southwest Virginia of a manufacturing city that will prove but the beginning of a great development for that whole region.

THE advantages and growth of Atlanta are admirably set forth in the letter from there published in this issue of the MANUFACTURERS' RECORD. Atlanta is a typical city of the New South. Its business men are live, energetic, always at work for the good of their city, and having unbounded faith in its future. Probably to this faith and to the united manner in which the people of that city join hands in every good work to push forward their town is due more of Atlanta's progress than to any other agency. Its natural advantages are great, it is true, but it is the vim and life of its business men that have made Atlanta what she is to-day. Its mercantile interests cover a wide territory, while its manufactures are probably more widely diversified than those of any other large place in the South.

A Wonderful Improvement in South Carolina.

South Carolina has made less progress during the last few years than a number of other Southern States, but yet the improvement there has been really marvellous. The summary from the News and Courier which we publish to-day shows a wonderful advance in that State and certainly proves that the development of the South has not been exaggerated. If the growth in this State has been so great, what must it have been in those where the iron and coal interests have attracted such wide attention and where towns and cities are building up almost as if by magic.

The News and Courier, however, is somewhat inconsistent for the purpose of making an argument against protection. In its issue of December 30, commenting on our statistics showing the remarkable industrial growth of the South during 1886, it claims that this was mainly in the iron interests and that it would be "far better for the South if the development were more general and more equally distributed," ignoring the fact that we called attention to the wide diversity of new enterprises throughout the South. It says: "The impetus given to the iron business, it is conceded, comes from without, and the profits from that business will largely go out of the South."

In this it is mistaken. It has been proven so often that it would hardly seem necessary to reiterate it, that Southern energy and Southern money are mainly responsible for the development of the iron interests of the South, and that the profits of this business are staying in the South and being reinvested there is an unquestionable fact. The very cheapness of Southern iron will, the News and Courier thinks, result in turning Northern protectionists against the interests of the South. These statements appeared in its issue of December 30. By January 1, however, the News and Courier had forgotten its complaint about the development of the South being mainly in the iron interests, and published a careful review of the progress of South Carolina, compiled by Major L. A. Ransom, a most reliable authority, in which the growth of that State in industrial and agricultural interests is shown to have been surprisingly large. So remarkable has this growth been that we publish in full to-day the editorial summary of the News and Courier, and invite the attention of our readers to it. While agriculture has made some improvement, it is in mining and manufacturing that the most rapid progress has been made. In 1860 South Carolina had \$8,615,195 invested in manufactures and \$49,000 in mining. To-day the figures are \$29,951,551 in manufactures and \$2,211,000 in mining. From 1879 to 1886 the railroad tonnage has doubled, increasing from 1,067,908 tons to 2,103,573 tons. It can, the

News and Courier thinks, be demonstrated that the gross income of the people of that State, man for man, is larger to-day than it was in 1860, when slavery was supposed to give so much prosperity, notwithstanding that a dollar now goes farther than ever before. The whole review bristles with facts and figures of great value and of universal interest, and we congratulate our able and enterprising contemporary upon this remarkably favorable showing for South Carolina, a State which, though sorely afflicted in the past, seems to be on the high road to prosperity. We have only one fault to find with the News and Courier: it will look at matters through free trade or "tariff for revenue only" spectacles.

Eight Thousand Miles of Railroad Built in 1886.

The predictions made during 1885 and the early part of 1886 in the MANUFACTURERS' RECORD that 1886 would be a year of great activity in railroad building have been fully verified. The actual work done has exceeded the highest estimates made by any reliable authority. The Railway Age predicted that 7,000 miles would be constructed, but its report for the year shows that this estimate was exceeded by 1,000 miles. According to this report the new mileage in the Southern States was as follows:

	Miles.
Maryland.....	4
West Virginia.....	104
Virginia.....	34
North Carolina.....	168
South Carolina.....	115
Georgia.....	138
Florida.....	321
Alabama.....	60
Mississippi.....	149
Louisiana.....	23
Tennessee.....	26
Kentucky.....	28
Arkansas.....	36
Texas.....	543
Total.....	1,826

Putting the average cost at the Railway Age's estimate for roadway alone of \$20,000 a mile, gives \$36,520,000 as the amount expended in constructing these 1,826 miles in the South, in addition to which was the great cost of equipments, improvements of old roads, etc. The Age very correctly says, and these remarks apply with especial force to the South, that "the expenditure for 8,000 miles or more of completed track during the year does not by any means indicate the total outlay in the way of railway building. A very large amount of grading, tunneling and bridge building has been done during the year for roads upon which no track has been laid. An astonishing number of new enterprises have either been actually undertaken or incorporated, and if the present favorable outlook for business continues it is probable that the year 1887 will show even a greater amount of railway building than the year just closing."

ANYONE desiring to invest in a daily newspaper enterprise in a prosperous Southern city, will find an advertisement in our Business Chances that may be of interest.

A Prosperous Year in Iron and Steel.

The past year was a very remarkable one in the iron and steel trades, and in most branches of these great interests was the most active and prosperous one for quite a while. The Bulletin of the Iron & Steel Association in its last issue makes the following estimate of the production of these four leading products in 1886, in gross tons, compared with the production in 1885:

Products.	1885—gross tons.	1886—gross tons.
Pig iron.....	4,044,526	5,600,000
Bessemer steel ingots.....	1,519,430	2,000,000
Bessemer steel rails.....	959,471	1,500,000
Open-hearth steel.....	133,375	200,000

Our production of iron ore in 1886 was about 10,000,000 tons, and we imported about 1,000,000 tons. In reviewing these trades for the year the Bulletin says:

Notwithstanding the steady increase in the demand for iron and steel during 1886 it is remarkable that prices advanced so slightly. Such advance as was established came gradually, and in some instances, as in the case of bar iron, too slowly to meet the increased cost of production. The price of nails during the year actually declined, although the consumption increased. In this case the producing capacity of the country is much beyond its wants. In the following table we give the average prices of leading articles of iron and steel, and of iron ore at the beginning and end of 1886.

Products.	Jan. 1.	Dec. 29.
No. 1 anthracite foundry pig iron, Philadelphia.....	\$18.50	\$20.50
Gray forge pig iron, Philadelphia.....	16.25	18.00
No. 1 gray forge pig iron, Lake ore, Pittsburgh.....	16.00	20.00
Best refined bar iron, Philadelphia.....	40.32	44.80
All muck-bar bar iron, Pittsburgh.....	38.08	42.56
Iron nails at store, Philadelphia.....	2.65	2.15
Iron nails at store, Pittsburgh.....	2.50	2.30
Steel rails at Eastern mills.....	34.50	37.00
Old rails, Philadelphia.....	21.00	24.75
Iron ore at Cleveland—		
No. 1 specular and magnetic Bessemer.....	6.50	7.00
No. 1 specular non-Bessemer.....	5.50	6.00

It may be said of the present prices for pig iron and steel rails that they have only recently been established, and that in the case of steel rails large contracts for delivery in 1887 have been made at \$34 and \$35.

Our importations of iron and steel during 1886 have been very heavy, and much in excess of the importations of 1885. In 1886 we imported about 400,000 tons of pig iron, about 75,000 tons of old iron, over 100,000 tons of steel blooms and billets, nearly 250,000 tons of tinplates, fully 125,000 tons of wire rods, and about 50,000 tons of steel rails. Our total importations of iron and steel in 1886 will amount to 1,000,000 tons.

The stocks of unsold pig iron in this country at the close of 1886 were probably no larger than at the close of 1885, when they amounted to 371,885 gross tons, which was a very small surplus when the pig iron wants of the country are considered.

During 1886 this country built over 7,000 miles of new railroad, against 3,131 miles reported by Mr. Poor for 1885. This great increase in railroad building in 1886 contributed largely to the improvement in our iron and steel industries which has been noticed.

The general business outlook for 1887 is at this time very favorable, and for our iron and steel industries it is especially so. Railroad building promises to be even more active in 1887 than in 1886. But none of us know what a day or a month may bring forth in the stock market, or in the financial or tariff legislation of Congress, or in the condition of the country's crops. Of one thing we feel certain. Speaking generally, prices must stop where they are or we will have such an influx of foreign iron and steel in 1887 as we have rarely if ever experienced. We need not dwell on the consequences which would be sure to follow.

An improvement in the condition of most of these industries had com-

menced in 1885, and when the new year opened and the temporary discouragement produced by the Connellsville strike had disappeared, the certainty of a much more active year than 1885 had become assured. Orders became more abundant, and except in one or two branches they have since continued to bear a most favorable relation to our producing capacity. Our production in 1886 of pig iron, Bessemer steel and steel rails, open-hearth steel, structural iron and steel, and some other products, has accordingly been much larger than in 1885, and our production of pig iron, Bessemer steel, Bessemer steel rails, and open-hearth steel has been much the largest in our history.

Caution Needed.

Two weeks ago we warned the people of the South against the danger that now threatens them of permitting a wild speculative fever to take possession of them. The South wants no "boom," nor does it want such a speculation in real estate that may react and injure all other interests. We are standing on somewhat dangerous ground and the business leaders of the South may well exercise great caution that nothing be done which would result in giving the present progress of that section a temporary set back. In commenting on our late editorial on this subject, the Mobile Register says:

These are wise and true words. It is unfortunate for any community, for any portion of this country, when the desire to become rich in a brief period amounts to a craze. There can be but one ending to such a craze. History repeats itself, and so does everything else in this world. "The thing that hath been it is that which shall be." Some men will make money out of this speculation and keep it; some will stop at the right time and make large profits; but many will hold on too long, and many will reinvest their gains and in time become sadder but wiser men.

There is but one safe way for a young man to endeavor to become rich. It is by hard work and economy. Of course, there should be prudent investment of the money saved yearly by economy, and, in our opinion, such investment can be found right here in Mobile. Whenever a man once enters the whirlpool of speculation, whatever he picks up in one swirl is apt to be lost in another. He may make a fortune, but there is no telling how long he will keep it. He becomes convinced often that his judgment is infallible, that he has but to engage in an enterprise to make a success, that he is a Napoleon of finance, that he has been born under a lucky star. And then some day he finds that he is only a "poor critter" like the rest of us, and that his boasted judgment is no better than that of other people.

We do not wish to be understood as discountenancing investments in the mineral lands of this State, or judicious and prudent investments in the cities and towns of that section, but it is apparent to even the casual observer that the prices now ruling in some localities have discounted the growth and improvement of years, and we cannot think that any community will be permanently benefited by an unhealthy and wild rise in values.

THE St. Louis Age of Steel of January 1 is a 48-page paper filled with many good things in the reading line. It is probably one of the best issues that the enterprising publishers of that paper have ever gotten out.

An Extensive Mining Enterprise in Arkansas.

The immense mineral wealth of portions of Arkansas which has within the last ten or twelve months attracted so much attention promises to cause a great industrial awakening in that State. The MANUFACTURERS' RECORD has repeatedly mentioned the wonderful mineral resources of the Bear Mountain section of that State and has reported the organization of probably a dozen or more mining companies formed to work the rich ores that have been discovered in that region. Most of these companies have engaged in mining for gold, silver, lead, &c., some of them having invested very heavily in the necessary machinery, while one half million dollar company, composed mainly of Pennsylvania capitalists, has undertaken to develop what is believed to be very rich manganese deposits, while others are working mines of very superior coal.

Two companies have just been organized in Memphis, Tenn., one with a capital stock of \$3,000,000 and the other \$1,000,000, to engage in the development on a large scale of vast mineral properties in Arkansas which the principal men in these companies have been quietly securing for several years. They obtained thousands of acres with a view to working the coal, iron and manganese deposits as soon as matters were in a proper shape, but recently desiring to make a thorough examination of their property, employed an expert geologist and assayer to undertake the work. His investigations, it is said, disclosed such a wealth of minerals as to surprise the owners of the property, and they then organized the two companies, one to mine for precious metals and the other to work the coal and iron interests, build furnaces, &c. Mr. T. H. Milburn, of the Milburn Gin and Machine Co., Memphis, who is interested in these enterprises, writes us that "they have the largest manganese property in the world, and close to it iron ore, coal, limestone and many other valuable minerals. In fact we have a better property than the celebrated Pratt mines of Alabama. There are now three railroads surveying through our property, and as soon as they reach us we will erect a furnace and smelter." It may be that within a few years Arkansas will begin to attract attention as a coal and iron center that will astonish those who have looked upon that State as a purely agricultural country.

A VERY interesting and valuable paper on the relative cost of electricity and gas under different conditions appears in this issue of the MANUFACTURERS' RECORD, for which it was written by Mr. D. A. Tompkins, a very able engineer of much experience. At the present day, when there is so much discussion regarding these two lighting agents, this contribution of Mr. Tompkins will prove especially opportune.

Great Mineral Resources that Ought to be Developed.

[Special correspondence MANUFACTURERS' RECORD.]

MORRISTOWN, TENN., Jan. 1, 1887.

The mineral ores of this section are beginning to attract considerable attention, both at home and abroad. I do not mean that home capital seems to be seeking investments in property of this character, for in fact it is not. Indeed it seems as if the few moneyed men of this country have never brought themselves to contemplate any other methods of making money than those to which they have always been accustomed. There is not so much progressive enterprise among them one would expect to find. A small mercantile establishment seems to fill the measure of more ambitions here than among any people with whom I have sojourned. There are shrewd business men here; but their idea of business is buying and selling. They don't seem to have caught on to the idea of making things.

When I spoke of the mineral ores of this section attracting attention at home, I simply meant that real estate owners are gradually opening their eyes to the fact that something more profitable than "corn and hogs" may be "raised" from their lands. Many of them are doing a little prospecting, and every day almost some inquiring countryman comes around with "a few rocks," which he wants examined, "just to see if they's anything in them." I have now some beautiful specimens of manganese, brown hematite, lead and zinc ores, and of variegated marble and hydraulic lime, brought to me in this way from lands in the immediate neighborhood of the city. The iron ores of this region excel in extent and variety anything I have seen or heard of.

It is claimed by a gentleman, residing here, that within a radius of 50 miles from Morristown every known variety of iron ore can be substantially duplicated. But capitalists from abroad are becoming interested in this section, and many letters of inquiry are received daily by prominent citizens, and hardly a day passes that some persons from a distance do not stop over here to prosecute inquiries or make examinations.

I hear it whispered that some of the parties who were interested in the Bertha Zinc Works and mines at Pulaski city, which were recently reported as sold to an English company, are looking to this section, with a view to opening mines and building works here. It would be, I think, a wise thing for them to do. Several parties, I hear, have recently been prosecuting inquiries in regard to the marble deposits in the vicinity. A party from Pittsburgh is negotiating for some extensive manganese deposits, south of the city some distance. Inquiries have been made by several parties from different quarters regarding the specular iron mountain about which I wrote in my last.

If the railroad fellows would only stop for a little while the gabble about deals, scoops, &c., I think immense bodies of mineral ores in this section would speedily change hands, and be put into the process of development.

The vast bodies of mineral ores of this section, situated as they are, convenient to the lines of transportation, and easy of access, cannot be much longer ignored. They will force themselves into notice.

K. S.

THE Daily Register, of Mobile, Ala., in its issue of December 28, said:

The Baltimore MANUFACTURERS' RECORD has shown the deepest interest in the growth and prosperity of the South. It has published from month to month accounts of the new enterprises inaugurated in this section; it has placed before the world the wonderful possibilities presented by our mineral resources. Whatever it says in regard to the South should have much weight with our people, for its words are not only those of a sincere friend and well-wisher of this section, but also of a journal that has made the material and industrial progress of the South its special care.

The Commercial Value of Electric Lighting.

BY D. A. TOMPKINS.

[For Baltimore MANUFACTURERS' RECORD.]

When the electric light first occupied public attention, a sort of panic ensued in stocks of companies whose business it was to furnish light by other means than electricity. Electric light companies were formed one after another in quick succession. Many of the original ones have not survived to the present day, and few of those that have lived have made dividends.

The failure to get satisfactory results in so many cases brought on a sort of conservatism on the part of possible users of electric light, and through the period of this conservatism the companies offering the machinery to the public have been obliged to give most unremitting energy to the matters of inducing the use of their machinery and especially to its improvement in directions to give better commercial results.

The early experiences of the companies furnishing electric light machinery, in supplying machinery wherever a willingness to purchase was expressed, irrespective of possible success from the purchaser's point of view and the naturally consequent failures and annoyances in so many instances, have all conspired to make manufacturers of electric machinery less careless of selling, irrespective of results, to anybody willing to buy, and more diligent in their efforts to remove imperfections in the machinery and appliances.

Like many new things, electric lighting came quickly into an undue popularity without much inquiry as to the conditions of its usefulness or commercial economy; suffered the usual reaction and for a period made exceeding little advance into popular favor. Then commencing a healthy growth, based upon improvements in the machinery and a more careful business system on the part of patentees and manufacturers, it may be said now to have reached and to occupy a fixed commercial value, and its economy as compared with gas under the same conditions may be accurately determined.

As street car lines may be, under certain conditions, a better investment than stage coach lines, and vice versa, so there are conditions under which electric light is cheaper than gas light and vice versa. Two systems of electric lights, different in all characteristics except in that both are electric, competed for favor when they were first introduced before the public. Wherever light was wanted, representatives of both systems claimed ability to supply it successfully and economically. For some time the public was considerably confused as to the relative merits of the two different systems. The systems referred to are the arc and incandescent.

Time and experience have determined that the arc system is most suitable, and, generally speaking, only suitable for lighting streets and uncovered large areas, and possibly, in exceptional cases, large interior spaces. The difficulties with it are to achieve regularity and distribution. Much has been done to make the arc light less flickering, but it is far from being entirely successful in that respect yet, and practically nothing has been done in the way of a better distribution of it since its first introduction. It took the lead of the incandescent system in street lighting and still holds its place in public popularity for that purpose.

Time and experience likewise quickly developed the fact that for interior lighting and for the purposes of factories, speaking generally, the incandescent light was the most suitable. Commercial considerations connected with the distribution of currents of electricity for incandescent lights have prevented any general use of the latter system for street lighting or for central station work.

The comparative estimates proposed to be made in this article will be for incandescent

lighting as applicable to the requirements of factories, hotels and other interior places where the cost of light is an item of much importance. For the purposes of comparisons, we will base our calculations on the following estimated costs of electric light plants delivered and set up at an average distance from the place at which the electric machinery is manufactured and under average conditions in a factory:

No. lights.	Price electric plant.	Elec. plant and engine.	Elec. plant & engine & boiler.
25 light.	\$ 500	\$ 775	\$ 2,000
50 "	800	1,150	1,500
100 "	1,250	1,750	2,800
150 "	1,650	2,450	3,850
200 "	2,100	3,000	4,750
300 "	3,000	3,800	4,600
500 "	4,500	5,600	6,500

The prices above given are for plants complete, the first column of prices being for equipments, where the power is furnished by a belt from the main shafting. The second column contains prices where an independent engine is put in to drive the dynamo, assuming that steam may be had from a boiler already in use for other purposes. The third column contains prices for electric light apparatus and engine and boiler all complete. For many manufacturing establishments, where sufficient extra power and a fair degree of regularity of motion already exist, the expenditure necessary to supply electric light would be that for the electric machinery only with belt and pulley to drive it from the main shaft; whereas, at hotels or other places where steam power would have to be put in the capital outlay necessary for an electric plant is necessarily much larger. In many cases where there is plenty of power and plenty of steam it is best, even then, to put in a small independent engine so that the light may be kept up, although the machinery of the establishment may not be running.

Taking now a 5-foot gas-burner or the equivalent of a 16 candle power incandescent lamp and making a comparison on the assumption that the electric lamps are good for an average life of 600 hours use as guaranteed by all the makers, we obtain the following results for one hundred 16 candle power lights operated for six hundred hours:

100 gas jets burning 5 feet gas per hour each equal 500 feet, and for 600 hours equal 300,000 cubic feet gas at \$3.00 per thousand.....	\$900
300,000 cubic feet gas at \$3.00 per thousand.....	600
300,000 cubic feet gas at \$1.00 per thousand.....	300

The conditions under which gas may be furnished at a high or low price and the conditions under which it is not possible to furnish it with commercial economy at all are known to the commercial world, and are always considered well in any contemplated works. Many people, however, fail to consider properly that under certain conditions electric light may be very much cheaper than under other conditions.

Taking the case of one hundred electric lamps of 16 candle power each to be operated and maintained in a cotton factory, power to be obtained from the main line shaft, and where an engineer or other person is already employed, to whose duties could be added that of giving to the electric light machinery such care as it needs, the estimate of the cost of maintaining one hundred 16 candle-power lamps, six hundred hours. (600 hours is the guaranteed average life of 16 candle-power lamps.)

100 lamps at \$1.....	\$100
5 lbs. of coal per horse-power per hour for 15 H. P. for 600 hours, 45,000 lbs., say 25 tons, at \$5 per ton.....	125
Addition to engineer's wages \$10 per month, say 3 months.....	30
Brushes, oil, sundries.....	5
Interest on investment, \$1,250, at 10 per cent. per year, say 3 months, about.....	30
Wear and tear machinery, same time.....	10
	\$300

Thus, under the above conditions, gas at \$2 per thousand feet would seem to be twice as expensive as electric light, and at \$1 per thousand feet the cost of gas light and electric light would be about the same, with the point in favor of gas that somebody else than the user is responsible to produce and deliver the gas ready for use, and the gas business is in such condition that the results are usually uninterrupted and satisfactory.

Taking the case of, say a hotel, where complete equipment of steam-power and lighting apparatus would have to be put in, and where also a proper attendant would have to be specially employed, we would have for cost of maintaining one hundred electric lamps for six hundred hours the following, viz:

100 lamps, at \$1 each.....	\$100
Fuel, same as in previous estimate.....	125
Engineer, at \$50 per month, for say 3 months.....	150
Interest on investment.....	40
Wear and tear.....	20
Incidental.....	15
	\$450

Which exceeds the cost of gas at \$1 per thousand, to furnish the same light, and is less than the cost of gas at \$2 per thousand, with the point in favor of the gas that, besides the responsibility of furnishing it being upon others, it is ready for use all day, as well as at night.

Probably the most favorable conditions existing for economical electric lighting are those in which power may be had at small or nominal cost, and where the necessary attendance may be had without extra cost. These conditions frequently exist where factories are run by water, or in steam mills where fuel is a matter of little or no cost, as in saw mills, planing mills, or cotton-seed oil mills, where a by-product of the mill is used for fuel that otherwise would be valueless or in the way, and thus worse than valueless. Take, for example, a large planing mill where both the items of fuel and attendance may be left out, shavings and other refuse being used for fuel and the engineer giving the necessary attention without extra cost. Then one hundred lamps for 600 hours would cost to maintain:

100 lamps.....	\$100 00
Interest.....	30 00
Wear and tear.....	10 00
Incidental.....	5 00
	\$145 00

An exceeding small cost for such an amount of light.

Connected with this subject it must not be overlooked that possibly every separate case would present conditions that would alter the relative economy of electricity and gas as lighting agents. In a hotel where the comparison is between 100 jets, burning 600 hours for gas, and 100 lamps, burning 600 hours for electricity, if the change were made from gas to electricity the guests would keep the electric lamps lit much more than they had been accustomed to keep the gas lit. Very many considerations, such as the above, enter into this light question, for which there is no basis of calculation, and these considerations are in some cases in favor of gas, and in others in favor of electricity. With an electric plant in operation in a hotel the exhaust steam from the engine may be used to heat halls, lobby and dining room, and other spaces if it was desired. In fact in the construction of a new hotel an exceedingly interesting problem of light and heat is presented, and in skillful hands most excellent results as to comfort, and exceedingly economical results as to cost of maintenance are now possible with combined electric lighting and steam-heating apparatus, the steam heating being done by the exhaust steam from the engine furnishing power for the lights.

To introduce the electric light and do it for entirely successful results the first cost should be considered and is essentially a capital outlay. Many people who figure on the subject expect to find that the cost of maintenance in, say one year, would not only be cheaper than gas but cheaper by the total amount of cost of the electric plant, thus bringing back the money invested and a profit besides. Considering that there are no wearing parts about a dynamo other than a plain shaft revolving in two plain bearings, the wear of which should be insignificant in ten years, and the wear of the brushes which is likewise insignificant, the cost of an electric plant should stand as an investment and not as an expense item.

The current is in no sense produced by friction or other mechanical means, but is a

physical effect of magnetic forces and electrical currents the one upon the other, the currents being produced by the passage of coils of wire revolving on the shaft above mentioned through the fields of electro magnets, part of the current generated being employed to produce the magnets. The coils of wire properly fastened on to the shaft constitute the armature, and the liability to accident of any sort is almost entirely in the possibility of the wire in the coils of the armature getting too hot, melting and "burning out." Such an accident causes delay and a considerable repair bill. Aside from this there is scarcely a possibility of accident, and the ordinary operation is exceedingly simple. If the operation of an electric light plant was not a very simple matter then it could be in no sense a competitor of gas under any conditions, for the gas being always at hand and being capable of being properly lit and extinguished by anybody except an occasional drunken man or ignorant people. Any other method for obtaining light must of necessity be simple of operation as well as economical to stand as a competitor.

Electric currents for incandescent lamps are in no sense dangerous to persons, the electromotive force of such currents being too low to do harm to the human system even if by chance the current should pass through a person's body.

In electric lighting bad wiring makes a liability to fire. With gas bad plumbing makes a liability to explosions and suffocation, but at the present time the liability of the latter is less than the former because plumbers, by better training and long experience have learned to be more careful than wire men can be obtained to be. As the matter of wiring for electric lights becomes a fixed trade and more experience is gained and better appliances introduced, the dangers from fire will grow less and less. Leaving out this matter of fire risk all the annoyances connected with furnishing light are confined to the engine and dynamo room the matters of suffocation, explosion, disagreeable smell from leakage, heating and deteriorating the atmosphere in rooms attendant upon the use of gas being entirely avoided by electric light.

Our estimates for electric lighting have been for isolated plants, or where a number of lights are required near where the power could be supplied. As the area over which it is desired to distribute a certain number of lights increases, the first cost of the plant increases out of all proportion to the area covered. The increased item of cost is the copper contained in the wire to conduct the current, and besides the increased first cost extra power is required and extra fuel consumed in keeping up currents in long and large wires. Many experiments looking to improvements in the direction of cheaper methods of distribution for currents suitable for incandescent light, and lately very encouraging results have been attained in an experimental way. Heretofore the expenditure for copper necessary to wire any very considerable area has put the question of central station lighting beyond the point of commercial success except in very thickly settled localities of large cities. The efforts to supplant gas for general domestic lighting and for public city lighting have not yet been practically successful. Strenuous exertions are now being made by inventors to improve machinery and appliances for making electric currents and gas, and for the distribution of them for public use. Improvements are daily coming out in connection with both, and whatever may be the final results as to their relative positions and special uses, they are probably both with us to stay as features of our civilization.

ADVERTISERS wishing to reach the manufacturers of all classes, mining companies, steel, iron and hardware dealers of the entire South, cannot find a better medium than the MANUFACTURERS' RECORD.

CONSTRUCTION DEPARTMENT

WE PUBLISH, every week, a list of every new factory, of whatever kind, projected anywhere in the South; every railroad undertaken, and every mining company organized. This information is always fresh, and, by enabling manufacturers to correspond with the projectors of such enterprises before their supplies of machinery have been purchased, is of great value. Manufacturers will find it to their interest to read this department carefully each week.

ALABAMA.

The Elyton Land Co., Birmingham, Ala., have purchased a 7,000,000-gallon pump for their water-works, previously reported.

The \$50,000 stock company reported last week as being formed at Montgomery, Ala., to build stove works, will also manufacture cast-iron water pipe. George W. Dudley and Moses Bros. are interested.

The Malvern Hill Woodlawn Land Co., capital stock \$75,000, has been organized at Birmingham, Ala.

The Western Valley Street Railroad Co. has been organized at Birmingham, Ala., with J. C. Westbrook as president, W. E. Berry vice-president, and W. H. Naff secretary and treasurer.

The Florence & Sheffield Transfer & Ferry Co., capital stock \$50,000, has been formed at Florence, Ala., by G. W. Swartz and others. Correspondence is desired with parties who have steam ferry boats for sale.

The Cahaba Valley Water Co. will be incorporated at Birmingham, Ala.

The Birmingham Ice Factory Co., Birmingham, Ala., will hold a meeting January 15th, to consider increasing their capital stock.

The Eufaula Water Co. will be formed at Eufaula, Ala.

The machinery has been purchased for a shoe factory to be started at Anniston, Ala.

It is stated that a company is being formed at Montgomery, Ala., to start a manufacturing town near Montgomery. W. L. Chambers can give information.

The furnace of the Round Mountain Iron & Coal Co., Round Mountain, Ala., lately reported as being repaired, has been leased by J. M. Elliott, of Rome, Ga., and associates.

Abel Woodward and Mr. Quarles, of Nashville, Tenn., contemplate starting a brick yard at some point in Alabama.

There is talk of a company being organized at Tuscaloosa, Ala., to build an iron furnace.

The Birmingham Tannery & Manufacturing Co., capital stock \$250,000, has been incorporated at Birmingham, Ala. Works will be at once erected near Birmingham.

A \$25,000 stock company has been formed at Calera, Ala., to establish a shoe factory. Work has commenced.

Messrs. Smith and associates, of Terre Haute, Ind., contemplate erecting a foundry and machine shop at Florence, Ala.

A furniture factory will be started at Florence, Ala., by Mr. Witherspoon.

G. W. Swartz will erect a planing mill and a shingle mill at Florence, Ala.

The Montgomery Soap Works, Montgomery, Ala., have completed an addition to their works, for the manufacture of toilet soap and are now putting in the machinery. They want to purchase glass dies for pressing.

ARKANSAS.

The Little Missouri Manganese, Iron & Coal Co., Memphis, Tenn., lately reported as incorporated, will erect a furnace and smelter at their mines in Arkansas, as soon as a railroad is built to their property. J. C. Neely is president; Thomas H. Milburn, vice-president, and Hunsdon Oary, secretary and treasurer.

Beam Bros. & Thompson, Bear, Ark., previously reported as erecting a saw mill and a stamp mill, are also erecting a shingle mill and planing machinery.

The Texarkana Street Railway Co., Texarkana, Ark., will shortly begin building their road.

The Newport Water Works Co., capital stock \$100,000, has been chartered at Newport, Ark., by A. H. McCormick and C. M. Davison, of Parsons, Kansas, and C. B. McKinney, of Newport.

M. T. Hancock, J. E. Biscoe and James A. Fones have incorporated at Little Rock, Ark., the Hancock Plow Co., capital stock \$50,000, to manufacture plows.

The Nonpareil Mining Co. has been incorporated at Hot Springs, Ark. The authorized capital stock is \$5,000,000.

The Bear Nut Mining Co. has been organized at Bear, Ark.

Frank R. Dillman contemplates erecting a machine shop at Paragould, Ark., next spring.

FLORIDA.

H. S. Greeno, St. Louis, Mo., has purchased 12 acres of marl land near Ocala, Fla., and will, with others, develop it.

A brick yard has been started at Sauble, Fla.

It is stated that an electric light plant is to be erected at Tampa, Fla.

Cook & Libbey, St. Augustine, Fla., are enlarging their wood-working factory.

GEORGIA.

H. C. Babcock, Dalton, Ga., has organized a \$20,000 stock company to rebuild the furniture factory of the Cherokee Manufacturing Co., previously reported as burned. Work is to begin at once.

Whaley & Holloway, Boston, Ga., are rebuilding their saw mill, previously reported as burned.

Hand & Gammon, Rome, Ga., will erect a saw mill and stave factory to cost about \$10,000.

F. Pence, Rome, Ga., will probably start a factory to manufacture toy wagons, &c.

The Etowah Manufacturing Co. has been formed at Rome, Ga., to manufacture furniture, by E. F. McGhee, J. T. Camp, T. F. Smith and others. A factory will be built at once. The capital stock is \$50,000.

A broom factory is to be started at Conyers, Ga.

Stratton & Brumbaloe have completed their new jug factory at Macon, Ga.

The Soque Woolen Mill, Soque, Ga., G. J. Foreacre, president, will erect a cotton factory to supply their woolen mill with their own warp.

Marsh & Co., Salt Springs, Ga., have purchased machinery to erect a wood-working factory.

KENTUCKY.

The Charles L. Mills Distilling Co., Milldale, Ky., are building a rectifying establishment.

John C. Glenn, W. H. McGee, E. T. Tramsen, C. H. Ferrell, J. C. Hailey and others will incorporate the Missouri, Tennessee & Georgia Railroad Co. to build a railroad from Humboldt, Tenn., to Hickman, Ky.

The Cincinnati & Newport Iron & Pipe Co., Newport, Ky., have let the contract for the erection of a new foundry and pipe works, 90x170 feet.

The Union Warehouse Co., capital stock \$150,000, has been organized at Louisville, Ky., with R. A. Robinson as president. The company have bought the buildings and machinery of the Louisville Cotton Compress & Warehouse Co., and will erect 2 new warehouses.

LOUISIANA.

The name of the \$50,000 stock company reported last week as organized at New Orleans, La., to establish a beef-canning factory, with R. M. Flautt as president, is the New Orleans Beef Packing & Canning Co. Work on necessary buildings has been commenced.

The Southwestern Louisiana Land Co., Opelousas, La., state that they will erect a rice mill with a capacity of 200 barrels every 24 hours, a cotton gin and a machine shop, and start a brick yard at the new town of Crowley.

MARYLAND.

The chief engineer of water department of Baltimore (office at 24 South street) is advertising for bids for furnishing about 2,210 tons of cast-iron water pipes and fittings.

The United States Electric Lighting Co., Washington, D. C., will put a battery of boilers, with a capacity of 1,400 horse-power, in their new building lately reported as being erected.

William C. Satterfield, Greensborough, Md., will rebuild his saw mill, reported last week as burned. He contemplates adding a flour and hominy mill.

The steam boiler and engine reported last week as being put in at 15 S. Frederick st., Baltimore, by John E. Prunty, is for the Prunty Manufacturing Co., who are erecting machinery to manufacture brass specialties.

A 7½-ton ice factory will be erected at Frederick, Md., by Brown & De Lashmott. The machinery has been purchased.

Henry Stockbridge, 306 Courtland street, Baltimore, will put in a 20-horse-power boiler and engine, and John Goeller, 245 South Wolfe street, will put in a 40-horse-power boiler and engine.

Wise Bros., Baltimore, will build a 5-story warehouse on Fayette street.

MISSISSIPPI.

The Kosciusko Tanning Co. has been organized at Kosciusko, Miss., to tan leather by the Ryan process. The necessary buildings will shortly be erected.

A stock company is being formed at Kosciusko, Miss., to start a creamery.

A company is being organized to build an ice factory at Meridian, Miss.

The Kansas City, Memphis & Birmingham Railroad Co. are making surveys for a branch road to Aberdeen, Miss.

NORTH CAROLINA.

The company reported last week as being organized to build a cotton factory at Asheville, N. C., by C. E. Graham, Richmond Pearson and others, will soon commence to build a plaid mill to have 5,000 spindles. Mr. Graham will visit machinery manufacturers about February 1.

A cigar factory will be started at Fayetteville, N. C., shortly.

S. T. Albert, U. S. agent, 810 Nineteenth street, N. W., Washington, D. C., will receive bids until January 31, for building a combined steam hoister and pile driver, to be delivered at Plymouth, N. C.

James D. McNeil, Fayetteville, N. C., has remodeled his flour mill.

Northern parties have purchased, it is said, the saw mill of Robert Page, Blue's Crossing, N. C., and will add a planing and wood-working mill.

James D. McNeill, E. D. Pemberton and A. A. McKethan, Jr., have formed a company at Fayetteville, N. C., to erect an electric light plant.

A saw mill will be erected at Stonewall, N. C., by W. H. Jacobs.

S. R. Chedester & Son, Asheville, N. C., will build a large brick addition to their hotel.

TENNESSEE.

The capital stock of the Knoxville Illuminating Co., Knoxville, Tenn., reported last week as organized, with Fritz Staub as president, is \$50,000.

The St. Joseph Land, Coal and Iron Co. is being organized at St. Joseph, Tenn.

N. T. Hannah, F. L. Woodruff, J. G. Henning, L. E. Patton and A. P. Taylor have chartered at Memphis, Tenn., the Memphis Lumber & Manufacturing Co., to manufacture lumber, boxes, &c.

Turner, Dillaway & Ransom, 50 State street, Boston, Mass., will make a proposition to build water-works at Memphis, Tenn.

The Bohlen-Huse Machine and Lake Ice Co., Memphis, Tenn., will erect a 60-ton ice factory. The cost, including ground, will be about \$90,000.

The incorporators of the Memphis & Nashville Railroad and the Tennessee Midland Railroad reported last week as chartered in Tennessee, are T. C. Leake, Jr., A. S. Buford, J. B. Pace, E. D. Christian, R. H. Temple and others, of Richmond, Va.; A. L. Crawford, Newcastle, Pa.; N. Baxter, Jr., and J. M. Hamilton, of Nashville, Tenn.; and W. D. Bethel, Napoleon Hill, and John Overton, Jr., of Memphis. The Tennessee Midland Railroad is to extend from Memphis to some point on the Virginia State line.

The Nashville Cable Railway, capital stock \$300,000, has been incorporated at Nashville, Tenn., to build a railroad about three miles long, by E. T. Noel, George K. Whitworth, George Davison, T. B. Fite and Henry B. Morrow.

The Summer Street Cable Railway has been chartered at Nashville, Tenn., by E. T. Noel, George K. Whitworth, George Davison, T. B. Fite and Henry B. Morrow.

The Nashville Iron, Steel & Charcoal Co., capital stock \$700,000, has been formed at Nashville, Tenn., by E. W. Cole, J. M. Head, E. H. East, J. C. Neely and others. The object of the company is to erect two 50-ton charcoal blast furnaces and a charcoal and chemical plant.

The Caney Fork Iron & Coal Co. has been organized at Tullahoma, Tenn., to mine for coal, iron, marble, etc., and to build and operate coke ovens and iron furnaces, with A. B. Tavel as president; W. R. French, vice-president, and L. D. Hickman, Jr., secretary and treasurer. The company own 40,000 acres of mineral lands.

The Cotton, Wool, Lumber & Manufacturing Co. has been incorporated at Memphis, Tenn., by N. T. Hannah, A. P. Taylor, F. L. Woodruff, L. E. Patton and J. G. Henning.

The Knoxville Flouring Mills, Knoxville, Tenn., will put in about \$4,000 worth of new machinery.

LOCKWOOD, GREENE & CO. MILL ENGINEERS

Office, 65 Westminster St., Providence, R. I.,

Carefully prepared plans, specifications and estimates furnished for the construction, equipment and organization of new mills and the revision and improvement of old.

It is reported that the Mossy Creek Manufacturing Co. has been formed at Mossy Creek, Tenn., to manufacture wire fencing.

Galbraith & Birchard have started a broom factory at Dayton, Tenn.

The Chattanooga Turn Verien, Chattanooga, Tenn., will erect a 3-story brick building to cost \$15,000.

The Nashville Iron Co., Nashville, Tenn., will put additional machinery in their new rolling mill to double its capacity.

The Knoxville, Cincinnati & Nashville Railroad Co. has been incorporated in Tennessee by E. R. Chapman, 26 Broad street, New York, S. H. Kneeland, G. B. Schley, W. K. Kitchen and C. H. Hicks.

The Mount Vernon Bridge Co., Mount Vernon, Ohio, have received the contract to build a bridge at Nashville, Tenn., to cost \$26,200.

The East Tennessee Consolidation Timber & Boom Co. has been incorporated at Knoxville, Tenn., by J. S. Churchhill, of New York, J. H. Barnerd, F. R. Curtis, T. H. Hinick and J. G. Martin.

The Brownsport & Cedar Creek Iron Manufacturing Co. has been organized at Nashville, Tenn.

The Chicago Rawhide Manufacturing Co., Chicago, Ill., contemplates starting a branch establishment at Nashville, Tenn.

The Bon Air Coal, Coke & Timber Co., Nashville, Tenn., will build from 200 to 300 coke ovens at Bon Air, near Sparta. The company will build a large hotel at the same place.

The Memphis City Street Railway Co. and the Citizens' Street Railway Co., of Memphis, Tenn., have been consolidated with a capital stock of \$1,000,000. The tracks of the older company are to be relaid and improved.

The Cincinnati & Birmingham Railroad Co., lately reported as incorporated at Nashville, Tenn., to build a railroad from the Cincinnati Southern Railroad to Birmingham, Ala., has been organized with M. R. Campbell, of Tullahoma, as president; J. C. Dougherty, Fayetteville, secretary; and G. C. Crane, Tullahoma, treasurer.

Some new machinery has lately been put in the mill of Shelton & Jordon, Triune, Tenn.

TEXAS.

The Victoria (Texas) Water-Works are being repaired and extended.

The city council of Waco, Texas, will receive bids for building water works.

The office of the Southern Manufacturing Co., reported last week as chartered at Austin, Texas, is San Antonio. The object of the company is to manufacture extracts, yeast powder, spices, &c.

\$12,000 has been raised at Bryan, Texas, towards erecting a cotton compress.

Mauermann & Lange, San Antonio, Texas, have moved their oil mill to another location, and are rebuilding it on a larger scale.

The Adams Mill Co., capital stock \$1,000,000, has been incorporated at San Antonio, Texas.

The contract has been let for the erection of an opera house at Temple, Texas, to cost \$21,850.

VIRGINIA.

The Harrisburg Handle Co., Harrisburg, Pa., have lately started a branch factory at Criglersville, Va.

The Virginia Marble Co., of Loudon county, Va., has been reorganized, with a capital stock of \$500,000, by W. H. Payne, H. D. B. Norris and others. B. F. Carter, Middleburg, treasurer, can give particulars.

E. C. Manning, Washington, D. C., has received the contract to extend the Atlantic & Danville Railroad from Belfield to Danville, Va.

Thomas Ball, Morrisonville, Va., will erect a saw mill.

Marshall & Goodwill and Douty & Goodwill, of Shamokin, Pa., will open mines in the coal field near Pocahontas, Va.

H. Hodges is president and treasurer and J. Turner White secretary of the Aetna Iron Works, reported last week as chartered at Norfolk, Va. The capital stock is to be not less than \$100,000 nor more than \$150,000.

WEST VIRGINIA.

The Ohio River Railroad Co. will hold a meeting at Parkersburg, W. Va., on February 5, to increase their capital stock from \$5,000,000 to \$6,000,000, and to consider extending their road to Huntington.

A street railroad is to be built at Charleston, W. Va.

The Huntington Water Works Co., capital stock \$200,000, has been incorporated at Huntington, W. Va.

BURNED.

The tobacco factory of Bailey, Allen & Co., Reidsville, N. C.; loss \$10,000.

The mill and gin of C. J. Bruton, near Troy, N. C.; loss \$1,000.

The saw mill and gin of Waters & White, near Alpharetta, Ga.; loss \$4,000.

The machinery of the Catocin Iron Co., Catocin Furnace, Md., damaged by a boiler explosion.

The saw and planing mill of Mr. Scott, Mandarin, Fla.; loss \$5,000.

The gins of W. D. Townsend, 6 miles from Rockingham, N. C.; B. E. Prince, Vicksburg, Miss.; Elbert Green, Waynesboro, Ga.; W. H. Ricks, near Mansfield, La.; Jackson & Gullatt, 9 miles from Mansfield, La.; G. W. Ragsdale, Dallas, Ga.; G. K. Smith, Sunflower Landing, Miss.; Hale Feazel, 6 miles from Farmerville, La.; Mr. Hunt, Greenville, Miss., (loss \$9,000), and Edmund Broussard, 8 miles from Abbeville, La., have been burned.

Will Erect 60-Ton Ice Factory.

MEMPHIS, TENN., Dec. 27, 1886.

Editor Manufacturers' Record:

We are erecting a Boyle machine at Tusculumbia with a capacity of about four tons per day. We shall run the machine in a few days for a test and then lay it up until spring. It is our purpose to erect a larger one at Sheffield as soon as that new town near Tusculumbia will warrant our doing so; but for this year this small machine with light shipments from here will supply Tusculumbia, Sheffield and Florence. We have just closed a contract with the De La Vergne Ice Machine Co., of New York, for a 30-ton ice machine for Memphis and shall also erect a 30-ton absorption ice machine of the most approved make alongside of the De La Vergne, which will give us 60 tons daily output in addition to our present supply. The plant, including grounds and building, will cost something over ninety thousand dollars, and will be ready for the ice season of 1887. R. C. GRAVES, Supt. and Treas.

Building a Beef Canning Factory.

NEW ORLEANS, LA., Dec. 27, 1886.

Editor Manufacturers' Record:

The charter has been obtained for the New Orleans Beef Packing & Canning Co. This company is fully organized, has purchased a site and have commenced building. R. M. FLAUTT, President.

Will Rebuild Factory.

DALTON, GA., Dec. 28, 1886.

Editor Manufacturers' Record:

I have organized a joint stock company, with cash capital of \$20,000, to rebuild the Cherokee Manufacturing Co's plant. Building will begin at once. A general lumber and furniture business will be done.

H. C. BABCOCK, Manager.

Little Missouri Manganese, Iron & Coal Co.

MEMPHIS, TENN., Dec. 28, 1886.

Editor Manufacturers' Record:

Our property is in Arkansas, and we have the largest manganese property in the world and close to it iron ore, coal, limestone and many other valuable minerals. In fact, we have a better property than the celebrated Pratt mines of Alabama. There is now three railroads surveying through our property. As soon as they reach us we will erect a furnace and smelter.

T. H. MILBURN, Vice-President.

WASHINGTON, D. C., Dec. 27, 1886.

Editor Manufacturers' Record:

We have let contract for the erection of our new station, corner of B and 13 1/4 streets, N. W. Also have let contract for a battery of boilers which will have capacity for 1,400 horse power. Will have 5,000 incandescent lamps ready for use by April next.

U. S. ELECTRIC LIGHTING CO.

Increased Capital Stock.

ATLANTA, GA., Dec. 27, 1886.

Editor Manufacturers' Record:

We have increased our capital stock to \$200,000, and largely increased our facilities for manufacturing.

U. S. AUTOMATIC WATER CUT-OFF CO.

JACKSONVILLE, FLA., Dec. 27, 1886.

Editor Manufacturers' Record:

We have established a wholesale beer depot and bottling establishment here in Jacksonville with capacity for one million bottles steam beer per annum, our own steam power and complete machinery, &c. Have built the finest plant in the State and propose to come in on a large scale.

GEO. MEYER & CO.

MIDDLEBURG, VA., Dec. 30, 1886.

Editor Manufacturers' Record:

The Virginia Marble Co., of Loudon county, Va., has just been reorganized by Mayor Grace, Jos. S. Spenny and J. B. Hill, of N. Y., and General Wm. H. Payne, H. D. B. Norris and others of Virginia. The capital stock is \$500,000.

B. F. CARTER, JR., Treasurer.

HAMILTON, VA., Dec. 29, 1886.

Editor Manufacturers' Record:

The report of our starting a saw mill is correct.

KINGSLEY BROS.

An Iron and Coal Mining Co.

LAMPASAS, TEX., Dec. 25, 1886.

Editor Manufacturers' Record:

The Texas Coal Prospecting, Developing and Mining Co. has been incorporated in this city for the purpose of mining coal, iron, &c. Incorporators are G. W. Ervin, J. W. Williamson, T. J. Largen, S. D. Crittenden, W. F. Gilbert and W. V. Ervin.

G. W. ERVIN, President.

Will Erect an Ice Factory.

FREDERICK, MD., Dec. 31, 1886.

Editor Manufacturers' Record:

Messrs. Brown & DeLashmutt, of this place, have contracted with the Frick Co., of Waynesboro, Pa., for a 7 1/2-ton compression ice machine, and will make artificial ice after February 1, 1887. The American Ice Co. has been organized in Frederick to do business in the West Indies. Mr. E. T. H. De Lashmutt is president, Mr. A. S. Brown secretary, and Mr. John A. Blattan manager. The latter gentleman leaves in a few days for St. Kitts, with a Cincinnati Ice Machine Co's absorption machine. This concern has been largely subsidized by the British Colonial government and promises to be a decided success.

J. A. BLATTAN.

Will Rebuild Saw and Grist Mill.

ABBOTTSBURG, N. C., Dec. 27, 1886.

Editor Manufacturers' Record:

I intend to build again. Will be 35 horse-power saw and grist, as before.

D. W. THOMPSON.

Opening New Coal Mines.

NORTH SPRINGFIELD, MO., Dec. 31, 1886.

Editor Manufacturers' Record:

The Kansas & Texas Coal Co. are opening new coal mines at Hackett City, Ark., to which point an extension of the St. Louis & San Francisco Railway is being built.

E. B. LOVELAND, Vice-president.

Erected Electric Light Plant.

POCOMOKE CITY, MD., Jan. 1, 1887.

Editor Manufacturers' Record:

We have erected an incandescent electric light plant here and at present we are lighting all of the business places and a large number of the dwellings and the entire streets. Our town is very nicely lighted. We use Edison system and consider it the best.

YOUNG & COLBURN.

VICTORIA, TEX., Dec. 29, 1886.

Editor Manufacturers' Record:

The city is extending its water works and repairing the stand pipe which was damaged in the storm of August.

B. F. WILLIAMS, Mayor.

Ice Factory to be Built.

SHEFFIELD, ALA., Dec. 30, 1886.

Editor Manufacturers' Record:

An ice company has been organized by Cincinnati and Sheffield parties.

A. J. MOSES.

MEMPHIS, TENN., Dec. 30, 1886.

Editor Manufacturers' Record:

The matter of the city erecting and owning its own electric lighting plant is in the hands of a committee from the council and depends upon their report. The entire council favor it, if it is deemed practicable and economical.

C. L. PULLEN, City Sec'y.

MERIDIAN, MISS., Dec. 31, 1886.

Editor Manufacturers' Record:

A company is being organized to build and operate another ice factory in this city, which will commence operation this summer. A new carriage factory has commenced operation in the city, composed of J. Maffett, J. S. Westbrook and E. D. Taylor, under the name of Meridian Carriage Works.

THOS. H. GRIFFIN, Mayor.

Rebuilt Works.

NEW ORLEANS, Dec. 30, 1886.

Editor Manufacturers' Record:

Our works lately partly destroyed by fire will be in full operation by January 15 of 1887.

ATLAS STEAM CORDAGE CO.

BEAR, ARK., Dec. 28, 1886.

Editor Manufacturers' Record:

We are putting in a new 60-horse power boiler, 50 engine, circular saw mill and shingle mill, cut off saw, planer and matcher. All our machinery comes from Cooper's, of Mt. Vernon, Ohio.

BEAM BROS. & THOMPSON.

SAVANNAH, GA., Dec. 1, 1886.

Editor Manufacturers' Record:

The Savannah Western Railroad has been organized. A corps of engineering will be put in the field as soon as suitable men are selected, the funds for preliminary surveys, &c., having been subscribed.

P. W. MELDRIM.

[FOR OTHER LETTERS SEE PAGE 783.]

The Gate City of the South.

The Past, Present and Future of Atlanta.

[Special correspondence MANUFACTURERS' RECORD.]

ATLANTA, GA., Jan. 1, 1887.

Atlanta, with an altitude of 1,085 feet above the sea level, is situated on the dividing ridge

MIDWAY

between the Potomac and Ohio rivers on the north, the Gulf of Mexico on the south, the Atlantic ocean on the east, and the Mississippi river on the west; in latitude 33 deg. 45 min., and longitude 84 deg. 23 min.

Situated at the base of the Blue Ridge, in the heart of the granite region, the water is pure and soft.

It has never experienced an epidemic. Its elevation and pure freestone water are a perpetual safeguard in point of healthfulness. Its death-rate for the last six years has been 19 per thousand. The average rate among the white population alone has been only 13 per thousand.

The rainfall and drainage on the east side of the city flows into the Atlantic ocean, and on the west into the Gulf of Mexico.

The swift-running streams on either side, with over 1000 feet fall to tide water, forbid anything like malaria in the near surroundings of the city.

The great elevation gives a perpetual flow of cool breezes, tempering the heat of summer, making the nights delightfully cool and pleasant. All these causes combined give Atlanta a remarkably vigorous and healthful climate, comparing most favorably with that of any city in the country.

TEMPERATURE AND RAINFALL.

Extracts from the records of the U. S. Signal Service station, showing the mean temperature, highest and lowest temperature, and the rainfall per season, and average of same for three years, at Atlanta, Ga.:

SEASONS.	Temperature Mean.	Max.	Min.	Rain fall.
Winter—Dec., Jan., Feb.	45.7	74.5	1.0	24.03
Spring—Mar., April, May.	60.4	90.8	25.0	14.37
Summer—June, July, Aug.	77.1	97.5	55.5	9.63
Fall—Oct., Nov., Dec.	63.3	90.5	20.0	9.39
Average	61.6	88.3	25.3	14.35

The population in 1880 was 37,409, and at this date over 60,000, a gain of about 60 per cent. in six years.

In 1880 the assessed value of real and personal estate, for taxable purposes, was \$17,680,000, and in 1885, \$28,892,639, an increase of \$11,212,639, or a fraction over 60 per cent. in five years. The true value to-day is fully \$55,000,000.

The municipal operations of the city are conducted under a carefully framed charter, with limitations against expenditures of the revenue for other than legitimate municipal purposes.

The municipal power is vested in a mayor, a board of councilmen and a board of aldermen, the separate concurrence of both boards being necessary to effect an expenditure, the mayor being vested with the veto power on all appropriations in excess of \$500.

The rate of taxation cannot exceed one and one-half per cent. of property, except in extraordinary circumstances. This power has never been exercised.

The indebtedness of the city amounts to only \$2,249,000. As an offset to this the city owns property to the value of \$849,125, leaving the actual indebtedness only \$1,400,875, or five per cent. on the assessed value of real and personal estate. This debt cannot be increased, and commencing with the near future its gradual extinguishment is required.

In 1885, the total income of the city from all sources, was \$726,587.

Atlanta is noted for its unparalleled growth since the war. The increase in population and values has been remarkable. In 1865 the population was 10,000, and in 1886, 60,000. In 1866 the valuation was \$5,500,000, and in 1885, \$28,892,639.

The construction of new buildings has averaged 1,500 per annum since 1880, and in some years has reached 2,000.

STREETS.

Number of miles, 140; streets paved, 12 miles; sidewalks, 230 miles; sidewalks, brick and curbed, 56 miles. Total sewerage 125,000 feet.

CHURCHES.

The white churches number 60, cost \$1,350,000, and have a seating capacity of 22,000. Colored churches 8, cost \$150,000, seating capacity 15,000. Total investment, white and colored, \$1,500,000. Seating capacity 37,000. Total membership 10,000.

FREE SCHOOLS.

The free schools of Atlanta are supported mainly by a direct tax. They are second to none in all that goes to make them thoroughly modern in every particular. So noted have they become for their efficiency and thoroughness that hundreds of families have taken up their residence in Atlanta in order to avail themselves of their superior advantages. There are 2 high schools, 9 grammar schools, with 90 teachers, a seating capacity of 4,341 pupils; cost of school buildings \$175,000. These schools have been in operation 14 years.

OF PRIVATE SCHOOLS

there are 11, with 2,234 pupils. Cost of school buildings \$270,000.

PRIVATE ORGANIZED INVESTMENTS.

The Young Men's Library Association (12,000 volumes), cost \$45,000. Catholic Library Association (2,000 volumes), cost \$3,000. Young Men's Christian Association Building cost \$75,000. Hospitals, \$30,000. Chamber of Commerce, \$60,000. Gate City Armory, \$30,000. West View Cemetery, \$50,000. Capital City Club, \$30,000. Four medical colleges, \$60,000. Two Gas Companies, \$450,000. Electric Light Company, \$30,000. Opera House (seating capacity 2,500), \$100,000. Street Railroads (22 miles), \$375,000. Total, \$1,338,000.

NEWSPAPERS.

Number of newspapers 20; presses 12; employees 283; combined publications per month 966,000; wages paid per annum \$164,000; capital employed \$164,710.

BANKS.

Atlanta has 2 National banks with a capital of \$650,000; 2 State banks with a capital of \$490,000; private banking capital, \$545,000. Total, \$1,685,000.

COMMERCE.

Atlanta, from her central position in the Cotton States, is an important wholesale center. She has over 100 wholesale houses, with a trade extending into the adjacent States of North Carolina, South Carolina, Florida, Alabama, Mississippi, Louisiana, Texas, Arkansas, Tennessee and Kentucky. Her annual sales reach \$72,000,000, and her retail trade over \$30,000,000, or a total of \$102,000,000.

Atlanta's altitude, 1,085 feet above sea level, gives her a dry, cool climate, enabling her merchants to carry large stocks at all seasons, and with entire safety. This remark applies not only to cured meats, canned goods and hardware, but to the finest and most delicate silks and laces. This is taken advantage of by her merchants, and large stocks are carried at all seasons without the fear of injury from climatic influences.

It is the only large market in the Cotton States having this advantage. It is nature's storehouse for the warm humid climate of the 10 Cotton States, covering an area of 690,000 square miles of territory, and embracing a population of 14,000,000 of people.

ATLANTA AS A COTTON MARKET.

Atlanta has become a leading interior cotton market. In 1872, the receipts were 16,000 bales; in 1884, 145,000 bales, and in 1885, 170,225 bales.

The city has cotton warehouses with a capacity of 45,000 bales, and three cotton compresses with a capital of \$300,000, working 200 hands, and with a capacity of 3,000 bales per day. Atlanta will continue to enlarge her cotton receipts.

Her railway facilities are superior to that of any other interior market in the cotton belt, her merchants enterprising, and their means ample.

THE ATLANTA MANUFACTURERS' ASSOCIATION was organized last August, composed of 150 of the manufacturers, leading merchants and bankers of the city, for the encouragement of local manufacturing interests, to gather and compile information and statistics relative to the establishment, growth and extent of the various manufacturing industries of the city, and to secure the foundation of schools of mechanical design for the education and encouragement of mechanics and manufacturers.

The association has accomplished much good in the dissemination of information relative to Atlanta as a desirable location for the manufacturer, and has been the direct means of establishing several new enterprises in the city. Properly supported, the association will accomplish great good for the manufacturing interests of the city.

The State of Georgia, by legislative enactment, has established

A TECHNOLOGICAL SCHOOL,

which, by the action of the commissioners appointed under the law, has been permanently located in Atlanta. The fund for its establishment is derived as follows:

From the State.....	\$65,000
" " " City of Atlanta.....	50,000
" " " " " annuity \$2,500 per year, 20 years.....	50,000
From citizens of Atlanta.....	20,000
" " " " " donation-site.....	10,000
Total.....	\$195,000

It will be the aim of the commissioners to secure the services of an able corps of professors, and to make the school as complete in all of its features as the most advanced institution of the kind in the country. After its establishment it becomes a part of the University system of the State, will be maintained by the State, and tuition will be free for citizens of Georgia.

MANUFACTURES.

In 1880 Atlanta had 196 establishments; capital employed, \$2,468,456; hands employed, 3,680; wages paid, \$889,282; value raw material consumed, \$3,159,267; value of products, \$4,861,727. In 1886 the number of establishments had increased to 303; capital invested, \$6,560,000; hands employed, 6,674; wages paid, \$2,425,000; raw material, \$6,460,520, and the value of products to \$10,221,600. This remarkable increase has been accomplished in the face of a depression extending over the whole country, affecting all interests alike. If so much has been accomplished during the first half of the present decade, what may not be expected in the last half, with all interests in a prosperous condition?

Unquestionably Atlanta's future growth and prosperity depends more largely upon the establishment and maintenance of diversified manufactures on a largely increased scale, than on any other interest.

Her location is such as to compel diversified industries. She cannot produce iron in its crude state, but she can manipulate the "pig" and "bar" into a thousand and one forms to supply the demands of commerce.

Fortunately she is neither an iron or a cotton city. Her surroundings will not induce her to "put all her eggs in one basket," like her competitors, who, when their one interest fails, are brought to a stand-still, having no other interest to fall back upon.

The town or city that wisely diversifies its industries, taking care to confine themselves to the wants of every-day life, to the production of such articles of necessity as the masses of the people are compelled to buy, whether the times be good or bad, that town or city will prosper under any and all circumstances. This is what Atlanta is doing.

ATLANTA'S RAILROAD ADVANTAGES.

Atlanta occupies a position unequalled in the south in its relations to the great railway systems that control transportation between the 10 Cotton States, and both the North and West. She is the focal point of four great

railway combinations—the Central, of Georgia, the Richmond & Danville, the East Tennessee, Virginia & Georgia, and the Louisville & Nashville systems, covering the entire Southern States east of the Mississippi river.

Atlanta has direct rail connection with the Atlantic ports of Wilmington, Charleston, Port Royal, Savannah, Brunswick and Fernandina on the east, south-east; with the gulf ports of Pensacola, Mobile, New Orleans and Galveston on the south, south-west; with the cities of Vicksburg, Natchez, Memphis and St. Louis in the Valley of the Mississippi; with Louisville and Cincinnati, the west and north-west, and the numerous towns and cities located on the vast net work of railways covering the 10 States embraced in the cotton belt.

ATLANTA'S CENTRALITY.

Drawing an air line from Atlanta to the Atlantic cotton belt ports, we find the distance to be 266 miles; to Mexican gulf ports, 270 miles; to the Mississippi river, 340 miles, and to the northern line of the cotton belt, about 200 miles. This centrality of location not only makes Atlanta the great natural interior commercial mart for this section, but standing as it does, on a plain 1,085 feet above the sea, with its unquestionable climate, breezy and delightful even in the warmest summer months, its absolute freedom from the slightest malarial taint, and its perfect healthfulness, point her out as the future great manufacturing city of the "New South." With a healthful climate, in which the artisan can follow his calling either in-door or out, with comfort all the year, with an exhaustless supply of coal, iron and timber of all kinds within easy reach, and at prices less than paid in the North, and with the 10 Cotton States, with their 690,000 square miles of territory, embracing a population of 14,000,000 of people as customers, at present, and for many years to come, with but little competition, Atlanta offers to the over-crowded manufacturers of the Eastern and Middle States a field well worthy of their skill and enterprise.

THE "NEW SOUTH"

as represented by Atlanta and her numerous advantages, is a wonderful field, such as the history of this nation has never before presented to the manufacturer. The keen intelligence and boundless energy of the Northern manufacturer needs only to understand the situation to avail himself of these advantages.

Atlanta's advantages may be briefly stated as follows:

1st.—A location in the heart of the cotton belt, with an elevation of 1,085 feet above the sea level, giving a cool, healthful and invigorating climate.

2d.—A summer resort for citizens from the low country and from cities in the cotton belt that do not stand as Atlanta does, on a breeze-swept plateau, over 1,000 feet above the sea.

3d.—The railway center of the cotton belt and the South.

4th.—A continuous and unbroken line of railways to five south Atlantic, and four Mexican gulf ports, covering the entire cotton belt.

5th.—The climatic advantages of being able to carry stocks of merchandise of all kinds through the summer months with entire safety.

6th.—The natural climatic trade center of the Cotton States.

7th.—A large cotton market.

8th.—The largest wholesale and retail trade of any interior city in the cotton belt proper.

9th.—The largest number of churches to its population of any city in the South.

10th.—The best free schools in the South.

11th.—The capital of the State.

12th.—No malaria, no epidemics, no cholera, no yellow fever.

The last-named advantage, "no epidemics," is destined to make Atlanta the leading manufacturing city of the South.

Atlanta's climatic advantages over all her competitors stands unchallenged.

E. HULBERT.

Double Cylinder Reversible Link Motion Hoisting Engine.

We present in this issue an illustration of the Lidgerwood Manufacturing Co's Improved Double Cylinder Link Motion Hoisting Engine, which is specially adapted for use in mines, either in shafts with platform cages or buckets, or upon inclines with the ordinary mining cars. As the engines are reversible, two hoists may be operated at the same time, one loaded car and cage going up while an empty car and cage is coming down.

The advantages claimed for this style of engine are simplicity of design, strength, durability, compactness, and rapid, economical and efficient working. The engine is thoroughly well made in every particular, only the best brands of steel and iron being used, and every effort made to ensure good workmanship. All parts of the engine are accessible, and can easily be got at for oiling, adjustment of lost motion, etc. They are particularly convenient as regards transportation, as they are so constructed that they may be taken entirely apart, packed in comparatively light packages, and then be

shaft being flush with the bearing. The drums are of cast iron, turned off true and spirally grooved for wire rope, or left smooth if desired. Oak lagged drums, either grooved or smooth, are furnished instead of iron, if ordered. The gearing is the usual spur wheel and pinion type, is made from true patterns, runs very smoothly and wears well, and is of strength and size in proportion to the lifting power of the engine. It is covered with a guard or band to prevent accidents, and in appearance, as well as safety, is an improvement over open running cog wheels. The cylinders are made of a superior quality of charcoal iron, are heavy and substantial, and are securely fastened to the bed plate, which is faced off to receive them. They have large steam and exhaust passages, and are specially designed for high speed. The cylinders are covered with a neat Russian iron jacket. The pistons are cast in one piece, and are pressed on the piston rods and held by a nut which is secured by a pin to prevent working off. They are fitted with packing rings of the usual locomotive type, which are steam tight, with very little friction either on the cylinders or rings, and give the best satisfaction

near as possible. They are forced upon the crank shaft by a powerful press especially designed for this work, and are also keyed to the shaft, thus ensuring their absolute solidity. The valves are the ordinary D slide valves, but are particularly well designed. They are made as wide and short as possible, so as to reduce the travel and decrease the friction, and require very little power to operate them; and the steam and exhaust ports being large, admit of rapid action and high speed. The valves and valve seats are scraped to a perfect fit. The valves are secured to the valve stem by clamps on each side of the valve, by which device any lost motion is easily taken up, and the corrosion which takes place when the valve stem is threaded and jam nuts used is entirely avoided. The valve stems and link block pins are of steel. The links and connections are of superior design, made in the best manner, and wear well, steel pins and composition jaws being used. They are counterbalanced by a weight on the reversing shaft, and can be handled easily. They are operated by a reversing lever, centrally located, which can be set to shut off steam at any point of the stroke.

without delay, as they are made in quantities, and finished parts of all sizes kept in stock. Every engine is set up, run and thoroughly tested at the works with steam before being shipped.

The engraving shown herewith represents the regular reversible link motion engine, with the addition of double spur gearing. This is claimed to be a decided advantage in all kinds of hoisting, either where the duty is heavy or where safety is particularly desired, and also does away with the band brake, which, in case of accident, the engineer, losing presence of mind, is frequently unable to apply. The gearing being double—and either set capable of carrying the entire load of the engine with safety—the danger from accident is almost impossible, and the strains being equally divided, the engines are more durable. As an additional protection, the engine is supplied with the automatic safety brake, which is applied by the reversing lever automatically whenever the links are moved to a central position. The brakes being applied to each crank wheel have the advantage of the gearing between the load held.

These engines are built by the Lidgerwood Manufacturing Co., 96 Liberty street, New York, whose handsome and elaborate catalogue of mining machinery will be sent on application.

MINING NOTES.

By T. K. BRUNER, Raleigh, N. C.

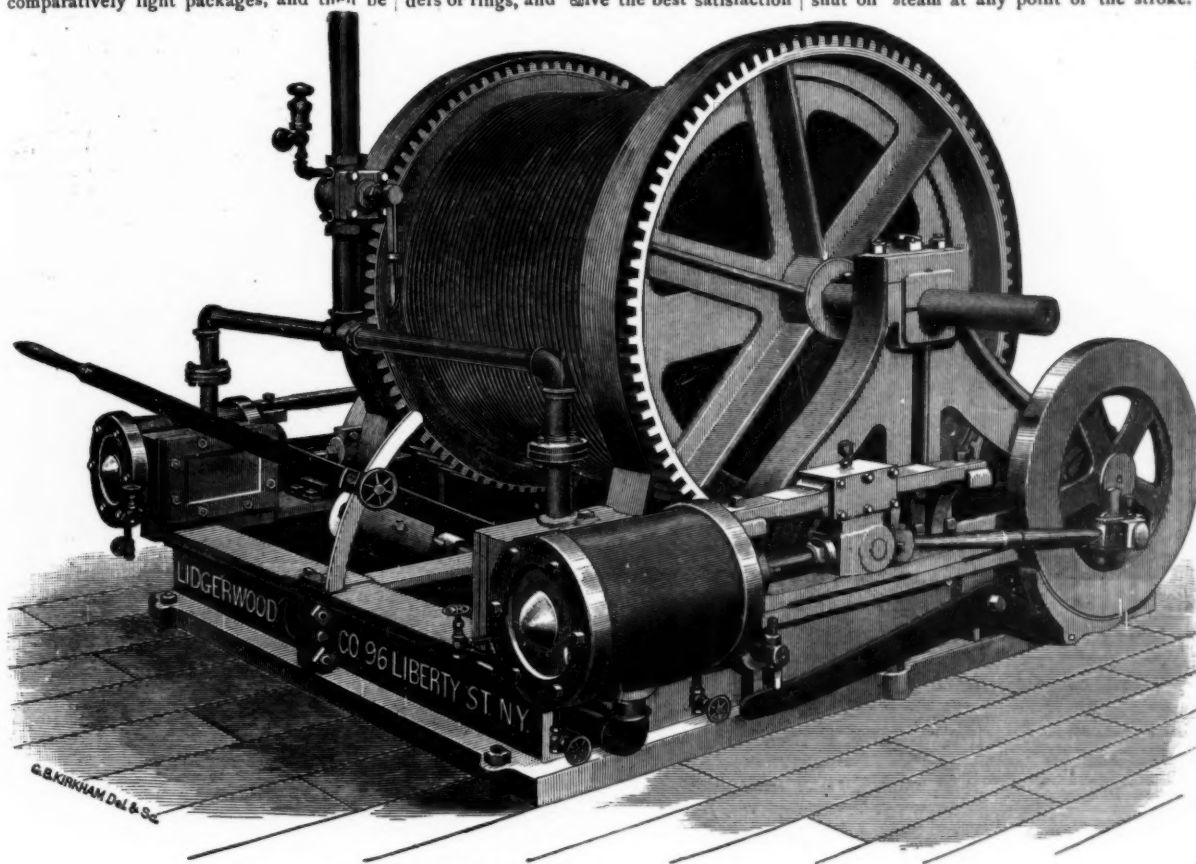
METALLIC ARSENIC.

Another mineral, heretofore unknown as having existence in this State, has been identified by Dr. C. W. Dabney, Jr., State chemist of North Carolina, as metallic arsenic. The specimen came from near Mt. Airy, in Surry county, and weighed originally about three pounds. It was broken in half and one portion sent to Dr. Dabney for examination and determination. After a number of tests had been applied it was declared to be metallic arsenic. Native arsenic is rare in the South. It has been found in New Hampshire and Maine, but, so far as the writer's information goes, it has not been found anywhere south of this State. Do not confound metallic arsenic with arsenopyrite, or any of the arsenic compounds, such as arsenites and arseniates, which are more or less common.

Metallic arsenic is remarkably volatile, as well as the most combustible of the metals. Its specific gravity is 5.96, and in the scale of hardness stands as the softest solid metal, being only 3.5. It is not a desirable thing to have associated with iron ore, as it has a tendency to make iron brittle; at the same time it gives great fluidity to melted iron. For this latter reason it is used to make sharp, or delicate, outline castings, especially where no great strength is required of the casting. It has no value as a metal, but is rare in this country, and is sought by collectors and men of science for cabinet purposes. It is interesting in that it adds another to the long list of minerals found in North Carolina.

ISENHOUR MINE.

The Isenhour mine, situated in Cabarrus county, and one of the Gold Hill group, seems destined to come into prominence. On several occasions allusion has been made to it in these columns, yet the place deserves more than passing mention. It is a type of the auriferous sulphide class, and its successful operation will be a great object lesson in teaching the usefulness of like properties now idle in the State. The possibility of making this class of ore profitable has not been considered entirely feasible in the past, perhaps because there was no means at hand for extracting the gold. It must be remembered that this class of ore carries no free gold, i. e., no gold which can be collected and saved by ordinary mercury



DOUBLE CYLINDER REVERSIBLE LINK MOTION HOISTING ENGINE.

erected by ordinary engineering intelligence, as all parts are fitted with face surfaces, steady pins, reamed bolts, etc. All parts are made strong and substantial, and in exact proportion to their cylinder power and required strains, with a large factor of safety.

The following general description of details is from the company's catalogue: The bed plates, of all sizes, are made in two or more pieces and bolted together, and are faced off to receive the rest of the engine. For ordinary shipments, it is only necessary to remove the bolts and take out the drum and crank shaft, leaving the cylinders, side stands, etc., intact upon each side piece, thereby causing very little delay or trouble in erecting again for duty. The side stands, which contain the drum and crank shaft bearings, are of the most substantial design, and are faced off to fit the bed plate, to which they are secured by bolts and steady pins. The bearings are of ample proportions, and filled with the best quality of anti-friction metal. The crank and drum shafts are of large diameter, and made of the best quality of wrought iron. As shown in the engraving, the drum shafts extend beyond the side stands, but we do not make them this way unless specially ordered, the drum

of any form of piston packing in use. The piston rods are steel, and are screwed into the crossheads and secured with a jam nut. The crossheads are of the improved hanging locomotive type, with extra large wearing surfaces, and are fitted with composition gibs on both sides of the slide. The wear can easily be taken up by simply removing the cap or plate at the side of the crosshead, and inserting thin sheet metal or paper packing between the crosshead and the gibs. This can be continued until the gibs are entirely worn through. The connecting rods are made of the best quality Ulster iron, with square ends fitted with straps, gibs, keys, set screws, and composition boxes, and are particularly well made and fitted. They are unusually long—being equal to seven times the length of the crank—thus reducing the pressure on the slides, and consequently the friction, making an easy running motion. The crank and crosshead pins are steel, the former being forced into the crank wheels and riveted over on the end. The crank wheels have heavy rims, and are counterbalanced opposite the crank pin, thus enabling the engine to run at high speed without sensible vibration, the inertia of the reciprocating parts being balanced as

The bolts and nuts used in putting the engine together are of the very best quality, and nuts on the same size bolts are interchangeable. The fittings comprise throttle valve, lubricator, oil cups and drip cocks, all of which are made by the company on special tools. The drip cocks of both cylinders are connected by means of rods, so that, by moving a lever convenient to the engineer, they can all be opened or closed simultaneously. The brakes are the Lidgerwood improved automatic brakes (as shown in the engraving), which operate automatically by the reversing lever through steel toes on the reversing shaft, the brakes being applied when the links are in the center, and letting go as the lever is moved either way to start the engine. The brakes being applied to each crank wheel, they have the advantage of the gearing between the load raised. When so ordered, the manufacturers put on the ordinary wood lined strap brakes, which are applied by a foot lever or a screw in the usual way.

The workmanship is of the best grade, and done on the best tools especially adapted to the work. All parts are made strictly to gauge, and on the interchangeable part system, so that any piece can be duplicated

amalgamation. The gold is so finely distributed that it remains in the sulphide until decomposed, or desulphurized, when it is easily saved. The ore from this property can only be treated to advantage in this way.

DESCRIPTION.

The Isenhour tract contains 216 acres, more or less, and is favorably located. The vein crosses the property in a line north by 35 degrees east, and is nearly half a mile in length by an average of three feet in width. There are four working shafts, distributed over a length of 181 feet, as follows: The engine shaft, 50 feet deep; the second shaft, 105 feet from the first and 55 feet deep; the third shaft, 64 feet from second and 46 feet deep, and the fourth shaft, which is but 12 feet distant from the third and about the same depth. This puts the property in position to be calculated; say 50x3x181 will give the number of cubic feet of ore in sight in the mine, while there are 60 to 80 tons of ore on the dumps.

The formation is Huronian slate, and the vein matter is talco-slate, quartz and iron sulphides. The crude ore assays as much as \$30 to the ton, and the concentrates run from \$37 to \$52 to the ton by actual work. The only work being conducted on the property just now is the concentration of the material on the dumps. The owners, however, contemplate increasing facilities with the coming spring and propose working the mine on a large scale. These plans may be interfered with by the mine changing hands, as there are negotiations pending which may result in putting new men and more money into the work. Should this transpire, the Isenhour would perhaps reach distinction earlier as a producer, though that seems to be the ultimate destiny of property, anyway.

A Defense of Cartersville Iron Ores.

[Special correspondence MANUFACTURERS' RECORD.]

CARTERSVILLE, GA., Dec. 31, 1886.

In the Iron Age, of New York, of 16th inst., appeared an article antagonizing the iron and manganese of this part of our State, in which it was claimed that the quality is so poor that there is no market for it, and that the only good ore is that owned and operated by the Dade Coal Company, of which Mr. Jos. E. Brown is proprietor. Why any one would write such an article is a mystery to me. Is it possible that the one who did so is simply mislead, or is it from interested motives? Surely it cannot be the former, because I cannot think any responsible party would write so grave an article simply from heresay evidence, because responsible men only write what they know to be true. Then if from interested motives, where does the motive and the interest come in? Was it written by some one who desires to cry down our property for the purpose of getting it at a lower price than it is now held? I cannot account for it on any other hypothesis, and if this be correct, then the motive is a most unworthy one.

Now for the facts. We have brown iron ore in great abundance and of fine quality. So abundant that there are plenty of places where a thousand tons per day might be mined for the next ten years, and to show its quality I quote from Prof. H. C. White, State Chemist at the University of Athens, Ga.

Sample brown iron ore furnished by A. R. McCutchen.

Metallic iron.....	61.100 per ct.
Sulphur.....	0.005 "
Phosphorus.....	.060 "

Sample gray iron ore by same party:

Metallic iron.....	64.500 per ct.
Sulphur.....	.012 "
Phosphorus.....	.021 "

Sample manganese ore by same party:

Manganese dioxide.....	87.960 per ct.
Equivalent to metallic manganese.....	54.975 "
Oxides of iron and alumina.....	2.520 "
Sulphur.....	.008 "
Phosphorus.....	.120 "
Silica.....	8.350 "
Water and organic matter.....	1.042 "

Sample manganese ore from same party:
Manganese dioxide..... 87.960 per ct.
Equivalent to metallic manganese..... 54.975 "
Oxide of iron and alumina..... 2.520 "
Sulphur..... .010 "
Phosphorus..... .065 "
Silica..... 2.175 "
Water and organic matter..... 1.015 "

The foregoing analyses were made as before stated by Prof. H. C. White, of the State University at Athens, Ga., from samples of ore obtained from the mines by A. R. McCutchen, geologist, and I imagine it would be hard for the correspondent of the Iron Age to find two men who stand more highly than do these gentlemen, and I am very sure any man who understood his business would be slow in questioning their reports.

I do not own any of these lands or mines, but as a citizen of this State I feel I would be derelict in duty were I to let so gross a statement pass without notice.

D. W. K. PEACOCK.

South Carolina's Remarkable Growth.

The review of the condition of South Carolina which is published to-day, presents to the public some unexpected and most gratifying results. It shows a far better condition of things than could have been anticipated, and justifies the expectation that the troubles of the people are approaching a close.

In the year 1886, 114 miles of railway were built in the State, and the total mileage now amounts to 1,754. The freight tonnage of the railroads has increased from 1,067,908 in 1879 to 2,103,573 in 1886, while the total income has increased from \$4,108,040 in 1879 to \$6,429,289 in the year just ended. These figures show in themselves the growth of business in the State.

In manufactures, the results are magical and marvellous. The number of manufacturing establishments in the State has increased from 1,230 in 1860 to 3,242 in 1886. The capital invested has increased from \$6,931,756 to \$21,327,970. The number of hands employed is 33,378 in 1886, against 6,904 in 1860, and 8,140 in 1870. The value of the product is \$29,951,551. The cotton mills give employment now to 4,889 persons. Close behind them come the fertilizer factories, with products valued at \$3,574,300. Roughly speaking, one person finds employment in the cotton mills for every thousand dollars of capital. In the fertilizer establishments one person is employed for every three thousand dollars of capital. This exemplifies the importance of cotton manufactures as furnishing abundant occupation. Taking the manufactures as a whole, one person is employed for every six hundred of capital. On the basis of production, each hand is represented by \$897. The statistics now given are well worthy of close consideration.

The information concerning the agricultural interests of the State is both elaborate and suggestive. There has evidently been a considerable reduction in the amount of goods and supplies purchased by the farmers on credit, but it is not evident whether this is due to greater economy of management or to increased difficulty in borrowing money. The tables showing the production of the principal crops are, too, of considerable importance. It appears that the crop of corn, while more than twice as large as in 1866, is still about ten per cent. less than in 1860. Wheat shows pretty much the same result. The crop of oats, however, is about four times as large as in 1860, and the production of potatoes has doubled. Curiously enough the yield of rye is less than half as great as it was in 1860. The cotton crop has risen from 353,412 bales in 1860 to 530,102 in 1886. The highest cotton crop reported is 630,000 bales in 1882. Tobacco shows a most gratifying increase on account of the experimental planting throughout the State last year. The crop is estimated at 465,309 pounds for 1886, against 50,350 pounds in 1882.

It is estimated that the value of agricultural and garden productions for 1886 was

\$44,109,501, and the value of the corn alone was nearly half the value of the cotton crop. There is food for thought in this, and there is still more in the little table which gives the gross value per acre of the principal crops in South Carolina. Cotton is no longer King, at least in South Carolina. Irish potatoes lead the list, with a value of \$88 per acre, as against \$12 for cotton. But even in these figures there is solid ground for the doctrine which The News and Courier advanced many years ago, viz., that in no place in the world is the gross product of the soil as large, in proportion to the market value of the land, as in South Carolina. Compare with it, for instance, the lands in the valley of Virginia, or in the James River bottoms. Where can be found a single instance where the crop will yield, in gross, every year the full value of the land, or, in any event, about three-fourths of it? Land which will produce \$12 worth of cotton to the acre can be bought in South Carolina from \$5 to \$12 per acre. This beats wheat farming in the West, or gold mining for that matter.

There is a most gratifying improvement in the condition of live stock, which is one of the beneficial effects of the stock law. South Carolina cannot be considered an unprogressive State when at one fair there can be exhibited 688 thoroughbred animals, ranging from cows to goats, all of which were raised in South Carolina, or are owned here, except some twenty-nine Devon and Durham cattle, which came from Virginia and other States.

The exhibit of the mineral resources of South Carolina will astonish some of our friends and admirers. Gold counts for comparatively little with us, but we have the phosphate deposits, which are more precious than gold, and which yielded last year 485,174 tons, which sold, it is safe to say, for at least \$2,000,000. Then, too, we have the big marl beds, an inexhaustible supply of kaolin, plenty of barytes, and a store of granite of the purest quality and incomparable beauty. Is not this enough to tempt Northern immigrants to come to South Carolina?

There is complaint on all sides that the agricultural interests—the bone and sinew of the State—are in a bad way, and perhaps the information which is now published will show a good reason for it. It is shown, for instance, that South Carolina consumed last year 38,430,425 pounds of bacon, which was made in other States. Put it at six cents a pound and the cost was over 2,000,000. South Carolina imported likewise 1,890,654 bushels of grain, 1,017,202 pounds of meal, together with 275,056 pounds of peas and 19,306,100 pounds of miscellaneous provisions. This was not a dead loss, but the five million dollars or more spent by South Carolina for provisions which can be raised at home, in connection with other crops, far more cheaply than they can be bought, will account in large measure for the present poverty of the people.

Looking over the list it is seen that the gross annual income, the total revenue of the people of the State, has steadily increased in spite of the uniform decline in market prices. We think it can be demonstrated that the gross income of the people man for man, is far larger to-day than it was in 1860. Besides this, there is the great fact that a dollar now goes farther than before. In comparison with 1865 or 1870, it is safe to say that a dollar to-day is as good as a dollar and a half.

As shown in our review, the total value of the farm products of the State last year was \$44,109,501. This is very nearly as much as the value of farm products in 1860. Add to the agricultural products the products in different branches of manufactures, and the products of the mines and quarries, and it is evident that the total income of the people from the three sources must amount to 50 per cent. more than the amount in 1860, when the slave system was

supposed to make the State so prosperous. Here is a rough table of the results:

	1860.	1886.
Manufactures.....	\$ 8,615,195	\$29,951,551
Agriculture.....	45,823,512	44,109,501
Mines and Mining.....	49,000	2,211,000
Total.....	\$54,487,707	\$76,272,052

In the mining we have included the value of the crude phosphate rock and the products of the quarries. The outcome of it all is almost amazing. Taking the population of South Carolina as 703,708 in 1860 and 1,100,000 in 1886, the average gross income of each person in the State was \$77 in 1860, against \$70 in 1886.

There is deep significance in these figures, which moreover take no account of the mercantile business of the State. Were the amount of general business added, it would be reasonable to say that the gross income of the people of South Carolina, their means of living and of spending, is considerably more than it was in 1860.

It is to be hoped that the good people of South Carolina can find in the statements laid before them to-day reasons for encouragement and confidence. This will be a great State if our people choose to make it so. No Commonwealth in the world has more or greater advantages. It is not out of place, then, on this New Year's day to say to the people of South Carolina, who have borne so much and have so much accomplished, that they cannot better mark this time of retrospection, and introspection, than by determining with all their minds and all their strength to make this year of grace, 1887, the best and most prosperous, the most peaceful as well as the most profitable, that this generation of South Carolinians has known. And, as Tiny Tim said, "God bless us, every one!"—News and Courier.

A Great Property for Sale.

GREEN FOREST, VA., Jan. 3, 1886.

Editor Manufacturers' Record:

The celebrated Buena Vista iron ore property, which is advertised in your columns, is now offered for sale at a reasonable price, and cannot fail to attract the attention of capitalists. It is one of the most valuable and available properties in the South,—situated in the center of the valley of Virginia, immediately on the Shenandoah Valley and Richmond & Alleghany railroads, in direct communication with three great coal fields; having unlimited deposits of rich brown hematite ore, with promising outcrops of manganese and tin, all within a short distance of the railroads. It stands without a peer among the iron properties of this section. If any further recommendation were needed, it can be found in the flattering quotations of the Amherst and Virginia warm-blast iron in the Cincinnati market, published in the Jan. 1st number of the MANUFACTURERS' RECORD. This iron is made exclusively from the Buena Vista ores.

B. C. M.

THE February number of Scribner's Magazine, of which 125,000 copies have been ordered as a first edition, will contain a most interesting article by Mr. John C. Ropes, upon the "Likenesses of Julius Caesar," with 18 portraits, one of which, engraved by Mr. W. B. Closson, will be the frontispiece of the number. A new story is begun in the same number by Mr. F. J. Stimson (J. S. of Dale) entitled "The Residuary Legatee." The second instalment of ex-Minister Washburne's "Reminiscences of the Siege and Commune of Paris" is one of the greatest, describing as it does the most interesting phases of the siege.

THE Augusta, Ga., Chronicle, famous for its splendid Trade Issues, has lately issued another, descriptive of Augusta and the country tributary to that city. Much of the credit for Augusta's growth and present prosperity must be given to the Chronicle and its energetic wide-awake managers. The Chronicle is an honor to Southern journalism.

Erecting Brass Works.

BALTIMORE, MD., Jan. 3, 1887.

We are about to commence the manufacture of Prunty Relief Valve and Nozzles and other brass specialties, at No. 15 South Frederick street. We are now putting in one boiler, engine and necessary machinery, and hope to be in active operation in a few days.

PRUNTY MFG. CO.

HARRISBURG, PA., Dec. 29, 1886.

Editor Manufacturers' Record:

We have started a branch factory of 3 lathes for turning up axe and pick handles in the rough, for shipment to this point to be finished and distributed. Factory is located at Criglersville, Madison county, Va.

HARRISBURG HANDLE CO.

Rebuilding Saw Mill.

BOSTON, GA., Dec. 29, 1886.

Editor Manufacturers' Record:

Our steam saw mill was burned on the 6th of October; are rebuilding; capacity will be from 4,000 to 6,000 per day square lumber.

WHALEY & HOLLOWAY.

Will Rebuild Saw Mill.

GREENSBORO, MD., Dec. 31, 1886.

Editor Manufacturers' Record:

I bought out G. H. Moore's interest in the burned mill in 1885. I expect to rebuild this coming spring, and think of adding a flouring and hominy mill to the proposed saw mill.

WM. C. SATTERFIELD.

OPELOUSAS, LA., Dec. 29, 1886.

Editor Manufacturers' Record:

This company was organized in July, 1886, with a capital stock of \$250,000. Its object is to encourage immigration and the settlement of this section with a class of people who will show by practical experience to our old residents the necessity of abandoning the use of old implements and the use of all modern improvements in machinery and agricultural implements. For this purpose the company, who own or have control of over a hundred thousand acres of good agricultural and grazing lands, propose to sell to new settlers at low prices and, when necessary, low terms of credit. The proposed new town of Crowley is situated on the Louisiana Western Railroad, near the center of Acadia Parish, and will probably be the county seat of that parish, lately created out of a portion of St. Landry. Rice being one of the main crops in that section, the company propose to build a rice mill having a capacity of 200 barrels in 24 hours; also a cotton gin, machine shop and brick yard. Other industries will be pushed and assisted by the company as the case may require.

SOUTHWESTERN LOUISIANA LAND CO.

Will Build Stove Works.

MONTGOMERY, ALA., Dec. 31, 1886.

Editor Manufacturers' Record:

I propose to build works for the manufacture of stoves and hollow ware and have formed a company with a paid-up capital of \$50,000, and also propose to manufacture cast iron water pipe.

G. H. DUDLEY.

Will Build a Tannery.

KOSCIUSKO, MISS., Dec. 30, 1886.

Editor Manufacturers' Record:

A stock company has been organized here, known as "Kosciusko Tanning Company," to tan leather on the new Ryan Process. The buildings will go up in a few days. Six or eight of our prominent stock men are engaged in getting up stock for creamery, and I do not doubt its success. Our large cotton warehouse has paid to stockholders 17 per cent. in last 60 days. Compress is now being talked of by our merchants for next season.

W. J. HAMMOND.

Copper in Nelson County, Va.NORWOOD P. O., NELSON CO., VA., }
January 3, 1887. }*Editor Manufacturers' Record:*

In addition to other good things, Nelson county, Virginia, has copper ore, and no doubt in large quantities.

In the year 1869-70 a few men, unacquainted with mining, took from a vein in the State rocks, near the surface, over 100 tons yellow sulphuret of copper, and sold it to the smelting works in Baltimore, yielding a good return for the small amount of work done. These parties had some falling out among themselves, and no work of any importance has been done there since. There was some uncertainty about the title which does not now exist.

"Copper greens" and small stones of yellow ore are to be seen for a considerable distance on the surface in a northeasterly and southwesterly course, no doubt indicating the course of the vein. Labor is cheap and plentiful here, and the point where this ore was dug is only about one mile from the Richmond & Alleghany Railroad, thus offering great inducements as to transportation.

Have often thought there are plenty of men in this country who would venture the small amount of money necessary to open this mine if known to them. Money is one of the few good things we don't happen to have.

I am acquainted with Mr. Jas. W. Tyson and Mr. J. Harry Lee, of your city, and if any reference is wanted I will take the liberty to refer to either of them.

ALEXANDER BROWN.

DELTA, LA., Dec. 29, 1886.

Editor Manufacturers' Record:

We have a contract from U. S. Government to build the "Panther Forest Levee," in Chicot county, Ark., 272,000 cubic yards, to be completed by 25th December, 1887.

GEO. ARNOLD & CO.

Will Build a Plaid Mill.

ASHEVILLE, N. C., Dec. 31, 1886.

Editor Manufacturers' Record:

We have just organized a company to build a plaid mill at this place, with 5,000 spindles and 250 to 300 looms. Will commence work just as soon as possible, and hope to be able to commence spinning by the time next season's cotton is ready for use. It is my intention to visit the machinery manufactures about the 1st of Feb.

C. E. GRAHAM.

To Build a Cable Railroad.

NASHVILLE, TENN., Jan. 1, 1887.

Editor Manufacturers' Record:

We expect to build a cable road. Have secured charter and will apply in few days for right of way through streets of city. The road will be about three miles in length. Necessary capital secured. Incorporators are Geo. K. Whitworth, E. T. Noel, Geo. Davison, Len B. Fite and H. B. Morrow. Will be constructed on best improved plans.

H. B. MORROW.

LOUISVILLE, KY., January 3, 1887.

Editor Manufacturers' Record:

The Union Warehouse Company, of Louisville, Ky., was organized December 30, with R. A. Robinson, as president; W. T. Grant, vice-president; and W. T. Leavell, secretary and treasurer. The capital is \$150,000.

The company has purchased the land (4 59-100 acres), buildings and machinery of the Louisville Cotton Compress & Warehouse Company for \$60,900 cash, and begun business January 1, with storage room for 7,000 hogsheads of tobacco, besides the current cotton business. As soon as the weather permits, an additional fire-proofed cotton warehouse will be erected on this property, and also a warehouse for tobacco and general storage on the canal, to accommodate the Main street trade.

D.

To Build Gas Works.

CLEBURNE, TEXAS, January 1, 1887.

Editor Manufacturers' Record:

A company has been organized for the purpose of building gas works.

L. A. GREENWELL.

Brick and Terra Cotta Works.

FLORENCE, ALA., Jan. 3, 1887.

Editor Manufacturers' Record:

We expect to make and manufacture brick and tile, also terra cotta. The company is to be named the Florence Brick, Tile & Terra Cotta Works.

SLATER & BIGELOW.

Will Erect Electric Light Plant.

FAYETTEVILLE, N. C., Jan. 1, 1887.

Editor Manufacturers' Record:

We have formed an electric light company here, consisting of Messrs. A. A. McKethan, E. L. Pemberton and myself. We have not as yet closed contracts with any company, though expect shortly to do so. It will be driven by my water-power, and will I think be a paying enterprise. *I have also just finished remodeling my "Merchant Mills" here, and now have the best mill, I think, south of Richmond.

JAS. D. MCNEILL, Pres.

Machinery Wanted.

MONTGOMERY, ALA., Jan. 3, 1887.

Editor Manufacturers' Record:

We have just completed an addition to our factory building to be devoted to the manufacture of toilet soap, and are now preparing to put in the proper machinery, a portion of which, however, we do not know where to procure—glass dies for pressing. We understand they are a recent discovery, and a great improvement on the metal dies now in general use. We will be greatly obliged if you can inform us of the address of any one or more making these glass dies.

MONTGOMERY SOAP WORKS,

J. S. MARKS, Sec'y and Treas.

NASHVILLE, TENN., Jan. 1, 1887.

Editor Manufacturers' Record:

The Caney Fork Coal & Iron Co. was chartered 24th December, 1886, by Albert B. Tovel, D. B. Corson, L. D. Hickerson, Jr., T. J. Morris, W. R. French, Jas. G. Aydolett, L. D. Hickman, A. Y. Smith, to mine for coal, copper, lead, zinc, mica, iron and other ores, minerals, quarrying marbles, and to construct and operate coke ovens, &c.

JOHN ALLISON.

New Enterprises at Florence.

FLORENCE, ALA., Dec. 29, 1886.

Editor Manufacturers' Record:

I have organized and secured charter for a steam ferry and transfer company to run between Sheffield and Florence and other points on Tennessee river. The capital stock is \$50,000; stock all taken. Boats will run every hour from foot of Alabama avenue to Florence landing, and connect with the street cars of Florence on one side and the street railroad from Sheffield to Tuscumbia on the opposite side. Would like to correspond with parties that have a few nice steam ferry-boats in good order that are for sale. Messrs. Smith and associates, of Terre Haute, Ind., contemplate erecting a large foundry and machine shop. Mr. Witherspoon has secured a site for an extensive furniture factory. There will be a planing mill and shingle mill started by me, as soon as a location can be secured.

G. W. SWARTZ.

WOOD ENGRAVING
ELECTROTYPING
- PRINTED SUPPLIES

Publishers of The Manufacturers' Exchange.

A. MUGFORD, Hartford, Conn.

Our correspondent at Cartersville, Ga., comes to the defense of the iron ores of that section in this issue. It is probable that there will be some authoritative statement as to the Cartersville ores in the near future, and the reported purchase a few months ago of Bessemer ore property in that section by Mr. de Bardeleben, of Birmingham. It has been claimed that there is no good Bessemer ore in that territory, and, moreover, that Mr. de Bardeleben has not purchased any property on account of its Bessemer ores. The statement as to this purchase was reported at the time in the MANUFACTURERS' RECORD on the direct authority of Mr. de Bardeleben himself, made to two of our correspondents. We were promised some time since that a full statement, supported by proofs, regarding this Cartersville Bessemer ore matter, would shortly be made public.

BALTIMORE

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A Weekly Paper,

Devoted to the General Commercial Interests of Baltimore and the South.

The Manufacturers' Record Co., having purchased from the Administrators of the late Geo. U. Porter, the JOURNAL OF COMMERCE and PRICE-CURRENT, will continue its publication as a general trade journal.

The JOURNAL OF COMMERCE had been conducted by Mr. Porter for 37 years, and was an acknowledged authority on all matters pertaining to the trade and commerce of Baltimore.

It is the purpose of the publishers to furnish a paper that no business house in Baltimore or the South, and no house having trade relations with Baltimore can afford to do without.

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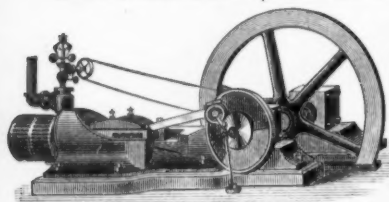
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SOUTHERN REFERENCES:

Eagle & Phenix Mfg. Company, Columbus, Ga.
Anniston Mfg. Co., Anniston Ala.
J. P. King Mfg. Co., Augusta, Ga.
Rose Mining Co., Charleston, S. C.
Maryland Pavement Co., Baltimore, Md.
Brush Electric Light Co., Baltimore, Md.
Ettrick, Matoaca and Battersea Mfg. Co's.,
Petersburg, Va.
Rasin Fertilizing Co., Baltimore, Md.
Tanner & Delaney Engine Co., Richmond, Va.
Sibley Mills, Augusta, Ga.

Graniteville Mfg. Co., Graniteville, S. C.
Charleston Bagging Co., Charleston, S. C.
P. H. Mayo & Bros., Richmond, Va.
Phosphate Mining Co., Beaufort, S. C.
Brush Swan Electric Light Co., Norfolk, Va.
Columbus Ice & Refrigerator Co., Colum-
bus, Ga.
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Vanceville Mill, Graniteville, S. C.
Charleston Electric Light Co., Charleston, S. C.

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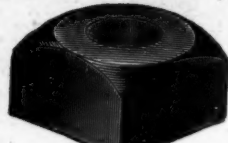
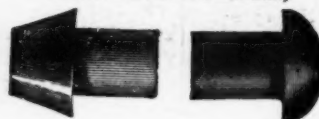
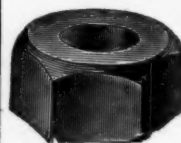
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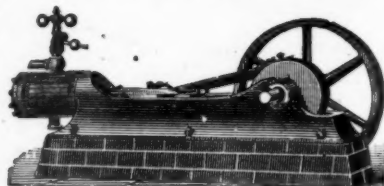
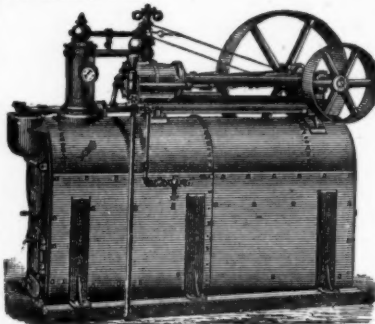
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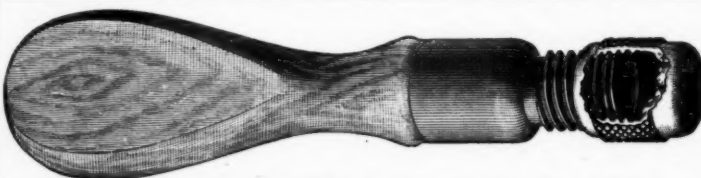
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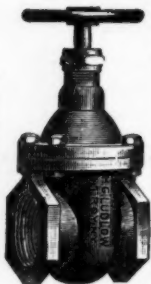
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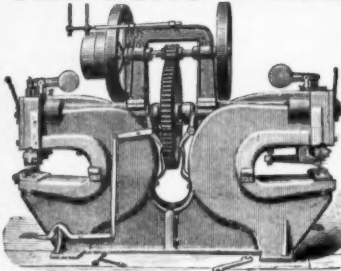


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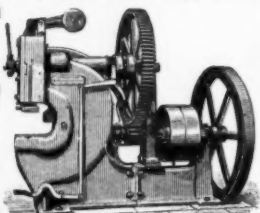
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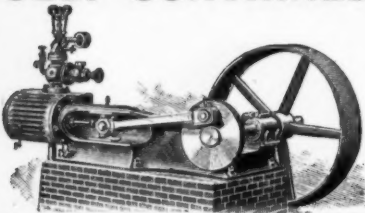
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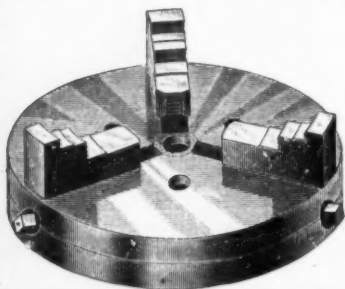
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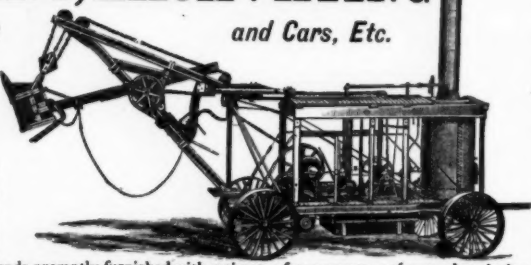
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Either a lifter or non-lifter; no extra valves or fittings required, tubes can be removed without disturbing
pipe connections; is perfectly automatic in its action; requires no especial manipulation to operate it.
Descriptive pamphlets and prices furnished on application to

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Winding Engines,
Furnace Hoists,
Mine Hoists.

(With or without Boilers.)

"Mining Plants," Concentrating Works, and Dredg-
ing Machinery Furnished Complete.

COPELAND & BACON,
85 Liberty Street, New York.

FAIRBANKS & CO., Agents, Philadelphia, Pa.
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Buffalo, N. Y.

References: { Croton Magnetic Iron Mines, Brewster's, N. Y.
Crown Point Iron Co., Crown Point, N. Y.
Belvidere Iron Co., 22 Broadway, N. Y.
Sea Island Chemical Co., Beaufort, S. C.



"STEAM"

A valuable book for every Steam user and Engineer,

published for FREE DISTRIBUTION by

THE BABCOCK & WILCOX CO.,

Manufacturers of

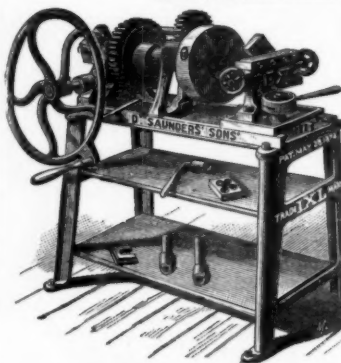
WATER-TUBE BOILERS,

107 Hope St., GLASGOW.

39 Cortlandt St., NEW YORK.

D. SAUNDERS' SONS,

MANUFACTURERS OF THE ORIGINAL

TRADE **I.X.L.** MARK.

Pipe Cutting and
Threading Machine.

BEWARE OF IMITATIONS.
None genuine without our Trade
Mark and name. Also

Patent Wheel Pipe Cutter

STEAM AND GAS FITTERS' HAND TOOLS.

Pipe Cutting and Threading Machine

For Pipe Mill Use a Specialty.

Send for Catalogue B.

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THE MIDVALE STEEL CO.

TIRES and AXLES

OF EVERY DESCRIPTION.

—TOOL—
AND
MACHINERY STEEL



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STEEL.

CRUCIBLE AND OPEN HEARTH STEEL.

Works & Main Office:

Nictown, Philadelphia, Pa.

BRANCH OFFICE:

325 Walnut St., Philadelphia, Pa.

GET THE BEST.



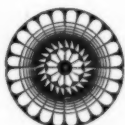
A Good Water Wheel Increases
the Value of Your
Whole Plant.

GET THE BEST AT FIRST AND AVOID THE
EXPENSE AND DELAY OF CHANGING
THE WHEELS.

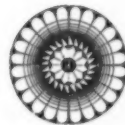
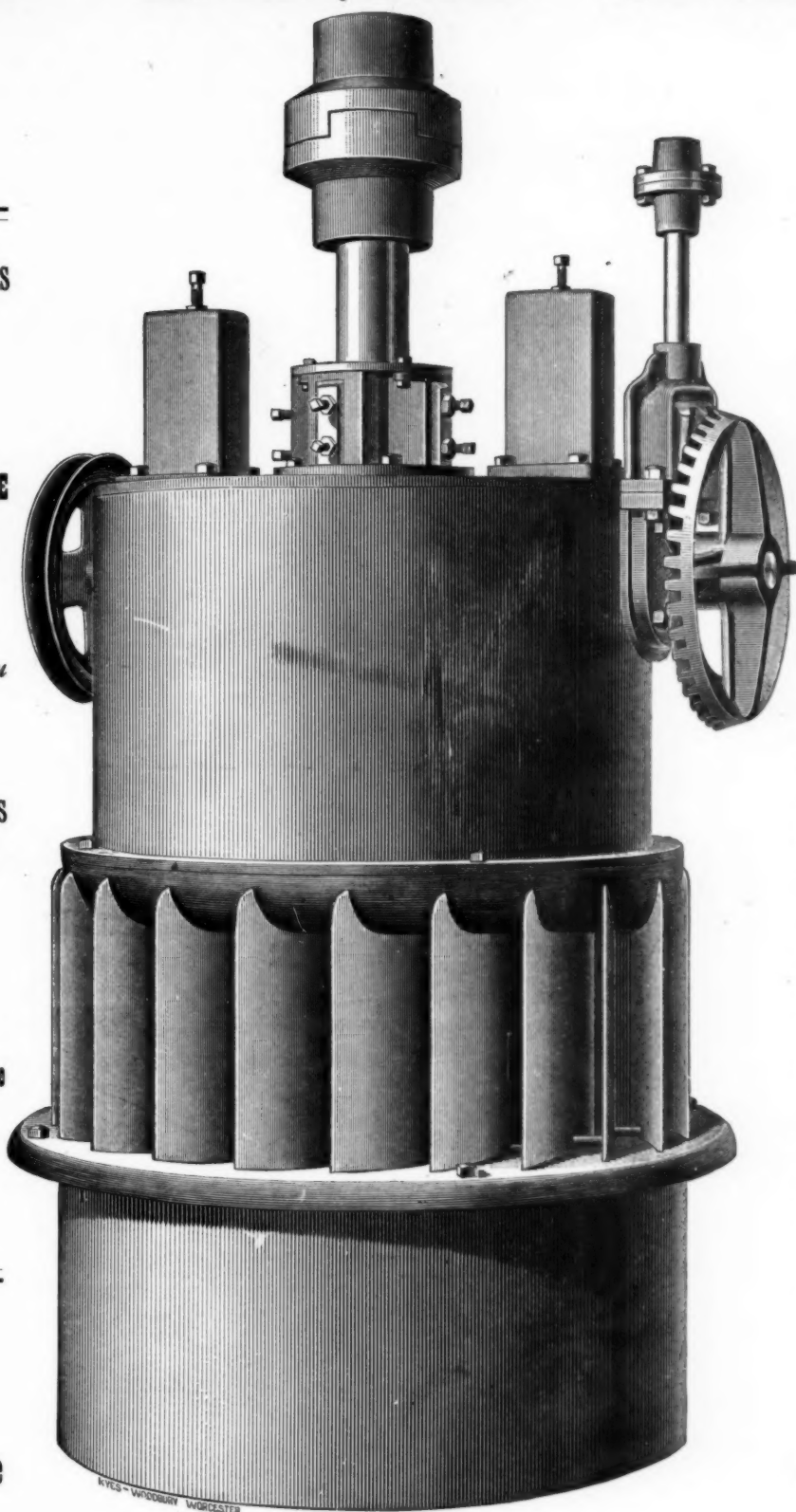
A Good Wheel Will Serve You
Well for Twenty Years.

THE BEST IS THE CHEAPEST. IT DOES
MORE WORK, LASTS LONGER, AND
COSTS NO MORE FOR GEARS
AND SETTING THAN A
COMMON WHEEL.

The Hercules Gives the Most Power for its Size
and the Highest Average Percentage
from Full to One-Half Gate of
any Wheel Ever Made.



Below we give the Names of the



When it is considered that
the HOLYOKE WATER
POWER COMPANY test
every wheel that is put in in
Holyoke, and use the wheels
as a gauge or meter for mea-
suring the water to the
manufacturers and charge
them for the actual quantity
of water used, it will be seen
that the HERCULES stands
first in the estimation of
Holyoke manufacturers as an
economical wheel in the use
of water for the amount of
power produced. The HER-
CULES, we believe, is the
only wheel of which all the
sizes, both right and left hand,
have been tested, some of
them many times, and all
brought to the standard of
excellence which has been
set by the makers and de-
manded by their customers.



Mills in Holyoke, Mass., using

THE HERCULES WATER WHEELS

THE HEAD OF WATER ON THE WHEELS AND THE POWER FURNISHED BY THE HOLYOKE WATER POWER CO.:

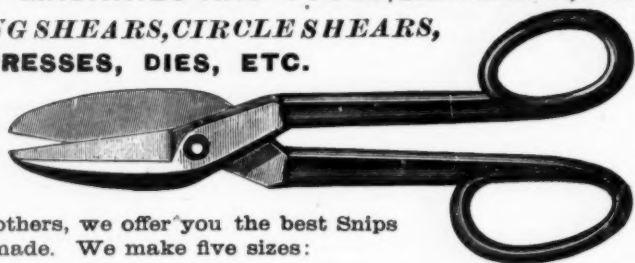
	Diam. in inches.	Head on Wheels.	Horse Power.	Date of Setting.		Diam. in inches.	Head on Wheels.	Horse Power.	Date of Setting.		Diam. in inches.	Head on Wheels.	Horse Power.	Date of Setting.
Albion Paper Company.....	39	25	295	1878	Geo. R. Dickinson Paper Company.....	36	19	170	1883	The Massasoit Paper Company.....	39	29	197	1883
Albion Paper Company.....	24	25	115	1883	Holyoke Water Power Company.....	30	19	115	1882	Union Paper Company.....	45	20	185	1882
Albion Paper Company.....	45	27	445	1880	Holyoke Warp Company.....	48	11	130	1879	Union Paper Company.....	30	20	125	1882
Albion Paper Company.....	30	27	200	1883	Massachusetts Screw Company.....	27	19	90	1882	Valley Paper Company.....	42	27	390	1882
Chemical Paper Company.....	4-30	23	620	1880	Merrick Thread Company.....	48	12	150	1880	Wauregan Paper Company.....	42	18	210	1879
Chemical Paper Company.....	5-18	23	275	1880	Newton Paper Company.....	48	21	350	1880	Wauregan Paper Company.....	33	18	130	1882
Chemical Paper Company.....	33	23	185	1880	Nonotuck Paper Company.....	48	20	570	1881	Whiting Paper Company.....	18	15	85	1882
Chemical Paper Company.....	42	23	305	1880	Nonotuck Paper Company.....	27	29	175	1881	Whiting Paper Company.....	18	15	30	1880
Chemical Paper Company.....	2-48	23	800	1880	Riverside Paper Company.....	48	20	325	1880	Winona Paper Company.....	48	22	540	1882
Connecticut River Pulp Company.....	36	18	155	1881	Syms & Dudley Paper Company.....	45	29	495	1881	Winona Paper Company.....	24	22	135	1882
Crocker Paper Company.....	39	25	300	1883	Syms & Dudley Paper Company.....	24	19	75	1881					
Farr Alpaca Company.....	48	19	300	1878	Springfield Blanket Company.....	36	18	155	1877					
Franklin Paper Company.....	39	20	215	1883	The Beebe & Holbrook Paper Co....	24	19	75	1884	Increase since.....				9,797
Geo. R. Dickinson Paper Company...	2-45	19	520	1883						Total.....				10,076

Increase since..... 9,797
Total..... 10,576

Send for
Catalogue
No. 3.

HOLYOKE MACHINE COMPANY, Worcester, Mass.

NIAGARA STAMPING & TOOL CO. Cor. Superior & Randall Sts.
BUFFALO, N. Y.
MANUFACTURERS OF
TINNERS' MACHINES AND TOOLS, FOR WORKING SHEET METALS, ETC.
SQUARING SHEARS, CIRCLE SHEARS, PRESSES, DIES, ETC.

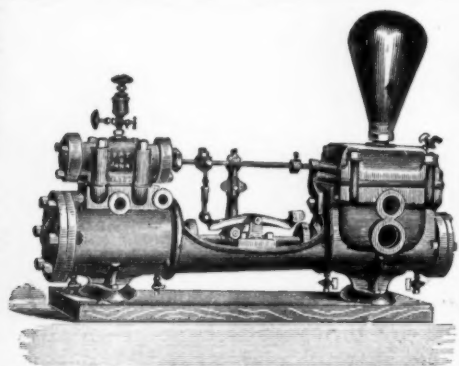


Tinners and others, we offer you the best Snips ever made. We make five sizes:

No.	10	9	8	7	6 1/2	No.	10	9	8	7	6 1/2
Cut.	2 1/2	3	3 1/2	4	4 1/2 in.	Price...	\$1.40	\$1.50	\$2.00	\$2.50	\$3.00
Weight	1	1 1/4	2	3	4 lbs.	Postage	18	25	30	48	70 cts.

We cannot send the Snips C. O. D.; it would cost 25 cents for return charges. Send your money by Postal Order, Postal Note, Money Order, or Postage Stamps.
Send for our complete illustrated Catalogue and Price List, and mention this paper.

DEAN BROS' STEAM PUMP WORKS.



The **STANDARD Steam Pumps.**

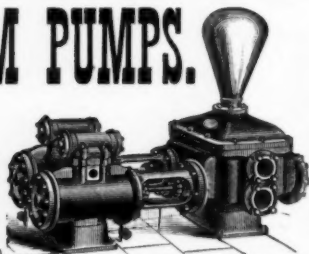
From KNOWLES' PATENTS with KNOWLES' VALVE MOTION, are the STRONGEST and MOST DURABLE Pump for every duty. MINERS, BREWERS, MANUFACTURERS IN THE SOUTH write for Prices and Descriptive Catalogue to

WHEELER & TAPPAN,
[Sole Manufacturers,]
Office, 88 WEST LAKE STREET,
CHICAGO, ILL., U. S. A.
Works, 49, 51, & 53 N. Jefferson street

HALL DUPLEX STEAM PUMPS.

Latest and Best.
FOR ALL DUTIES.
Simple! Durable! Efficient!

SAM'L B. WAITE & CO. 40 Hughes St.,
BALTIMORE, MD.
Send for a Catalogue.



STEAM PUMPS

SEND FOR PRICES TO
VALLEY MACHINE CO. EASTHAMPTON, MASS.

BLAKESLEE MANFG. CO.
67 WASHINGTON ST.,
DU QUOIN, ILL.

STEAM PUMPS
FOR ALL PURPOSES.
SEND FOR CATALOGUE

SPARGER'S White Heat Steel Welding Compound.

- It is superior to borax or anything else.
- It will weld steel to steel as easily as iron is welded to iron.
- It will restore steel when burned.
- It both welds and refines at the same time.
- It never misses welding when heated hot enough.
- It does not waste away steel as does borax and other compounds.

Any tool cracked in tempering can be welded by one application, and I positively guarantee that steel will not crack after it has been worked in the compound. Testimonials of its efficacy in hand from practical machinists in New York, Pittsburgh, Newark and other cities. Sold in bulk at 5 cents a pound. Address

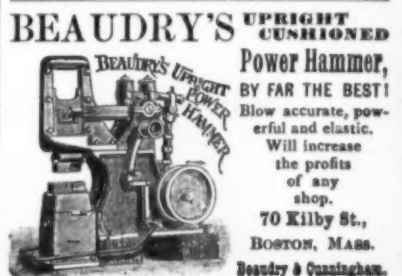
W. A. SPARGER, Bristol, Tenn.

Information about the South.

THE marvelous mineral and timber wealth of the Southern States, their unrivalled capabilities as a manufacturing area, and the astonishing progress they are making in developing their natural resources and in utilizing their facilities for manufacture, are attracting the attention of the whole world. The extent of these resources and advantages is so fully and carefully set forth, and the progress of this development so faithfully chronicled from week to week in the **MANUFACTURERS' RECORD**, that it is now accepted everywhere as unquestioned authority on Southern affairs, and its statistics and statements are drawn upon by almost every writer or speaker on any Southern topic.

Its weekly issues constitute an authentic history of the industrial progress of the Southern States. It furnishes every week a vast variety of information on Southern affairs that can be gained from no other source. It discusses in its editorial columns and in its correspondence every topic of Southern interest. It presents the resources and development of the South in all their phases. To all who are in any way interested or concerned in the prosperity of the South, or who care to keep posted as to the industrial and commercial progress of that section, the **MANUFACTURERS' RECORD** is indispensable.

It has a constantly increasing circulation among capitalists and others in the North and West, who desire to keep informed as to Southern affairs.



Advertising in Foreign Countries.

Advertisers who desire foreign trade would do well to correspond with Dumont & Co., 10 and 12 Old Slip, New York, who represent the leading newspapers of South and Central America, Mexico and the West Indies. Their new trade journal, "El Anunciador," has a circulation of 5,300 and upwards, and each copy sent out is mailed in a separate wrapper and not expressed in wholesale quantities as is sometimes done. A statement is sent out in each issue showing the exact number sent to Ecuador, Peru, U. S. Colombia, Brazil, Central America, Bolivia, Venezuela, Uruguay, Chili, Argentine Republic, Mexico, Cuba and the Islands, &c. It numbers among its advertisers some of the best houses in the country, who speak highly in its favor. Send to Dumont & Co. for sample copy and rates for advertising.

CARNEGIE BROS. & Co. have decided to erect a new steel rail mill at Braddock, Pa., and work on the structure will be started within thirty days. The new plant will cost upward of a million dollars, and will give employment to a large number of men. The company's works will then have a capacity of 400,000 tons of rails per annum.

H. E. MCWANE & Co., Wytheville, Va., write: We are manufacturing a large quantity of coke oven castings for Cooper & Co., Booth & Co., Stephenson, Mullin & Co., and Freeman & Jones, of Bramwell, West Virginia; and a lot of mine car castings for the Southwest Virginia Improvement Co., Pocahontas. We are running our foundry to its fullest capacity.

Business Chances.

For the purpose of making the MANUFACTURERS' RECORD a still more valuable medium of communication between its readers North and South, we will publish, FREE OF CHARGE, short advertisements, not exceeding 40 words, from those in the South who have good business openings that they wish to bring to public notice, capital wanted for industrial enterprises, &c., &c.; while readers in other sections who desire to engage in manufactures at the South are also invited to use these columns, without cost, either in seeking information regarding the advantages and special claims of different localities, or for asking about good openings for men and money. This department is also free for Southern manufacturers who wish to advertise for mill managers, superintendents, engineers, &c.

In corresponding with any of these advertisers please mention the Baltimore Manufacturers' Record. Parties advertising in this column must have replies sent to their own address, and not to care of Manufacturers' Record, unless stamps are sent for forwarding replies. Advertisements sent not in accordance with this requirement will not be inserted.

WANTED.—A partner with capital to start a daily paper in a rapidly growing Southern city, with 12,000 p. cent. population. Have a paying semi-weekly with a good job office and stock, type, presses and fixtures worth \$4,000. Unincumbered and out of debt to start with. Will also negotiate with a good job printer familiar with the stationery, printing and publishing business to enlarge a presently prosperous business. A young man preferable, but for either of the above positions a man is wanted with some capital, and one who will follow his money into the business and look after it. Money wanted for extension solely, not to pay old debts. Address Box Q, Pensacola, Fla.

WANTED.—A dyer of long experience in cotton and wool, all shades skein yarn, warps, &c., and thorough knowledge of hot and cold vats, wants a position in the South. Address J. McHugh, 206 Levering street, Manayunk, Phila., Pa.

WANTED.—An energetic traveling salesman, experienced in selling engines, machinery, &c. Address P. E. W., care MANUFACTURERS' RECORD.

WANTED.—By a young Englishman, who has had a number of years' experience in cotton and woolen mills, a position as assistant loom fixer. He is conversant with everything pertaining to the weaving of either cotton or woolen fabrics. Address W. K. Gray, 64 St. Paul street, Baltimore, Md.

WANTED.—The address of dealers in pig iron and fire-brick for cupolas. Address Perry Machine Works, Plymouth, N. C.

WANTED.—Situation as superintendent in an iron or woodworking establishment, or in the manufacture of saw mills, steam engines or special tools. I have several important inventions which I cannot advance for want of capital. Address H. F., 2014 W. Market street, Louisville, Ky.

MINING ENGINEER, having 14 year's experience in Southern gold, silver, copper, zinc, manganese and iron ore, and who has options and leases on very valuable property, wants partner with some capital, to assist in developing. Address, Mining Engineer, P. O. Box 157, Roanoke, Va.

WANTED.—A situation as designer and manager, by an Englishman of twenty year's experience in the manufacture of all kinds of plain and fancy woollens, worsteds, serges, union cassimeres, &c. Highest references. Four years with present employer in North-Eastern States. Address, P. O. Box 820, Rockville, Conn.

FOR SALE.—Near Tampa, Fla., a five-acre orange grove, four years old, with fifteen additional acres, all under price. Title perfect. For particulars address, George A. Smith, Tryon City, N. C.

WANTED.—In Chattanooga, Tenn., a partner with \$15,000 to engage in manufacturing a new article that promises return of 100 per cent. per annum. Address Manufacturer, care P. O. Box 133, Baltimore, Md.

WANTED.—A situation as traveling salesman or State agent for a machine and implement house, to be represented in Texas, by a man 10 years in the business; well acquainted over the State; references given. Address G, 721 Germania st., Dallas, Texas.

WANTED.—To sell an interest in a growing foundry and machine business, or will pay 10% interest and furnish good security on a five year loan. Works are located in a rapidly growing city, which in two years will be the largest railroad center in the South. I have no local competition. My object is to raise money with which to improve the plant to meet growing trade. Address L. M., care MANUFACTURERS' RECORD.

RARE OPPORTUNITY.—\$900—one-half cash, the balance on time—will buy one-half interest in a well-established newspaper and job office, with a liberal patronage. Paper located in a town of 2,500 inhabitants. County site of the richest agricultural and mineral country in Georgia. Purchaser must be a good, practical printer, sober and with good character. Young man preferred. Reason for wanting to sell is that my professional business requires most of my time. Address Douglas Wike, Cartersville, Ga.

FOR SALE.—100,000 acres original yellow pine, heavily timbered, located in Middle Georgia; healthy and accessible; trunk line railroad now building through the lands; rare opportunity for naval stores and lumbermen and investors. Address James G. Holmes, 65 S. Gay street, Baltimore.

WANTED.—Capitalist to purchase block of \$5,000 of stock "on ground floor" in a land improvement company in Middle Georgia. One of those opportunities offered only in the New South to investors or actual settlers. Address James G. Holmes, 65 S. Gay street, Baltimore.

WANTED.—Situation as superintendent of cotton factory. Best references given. Now engaged in the South. Address N. C., care MANUFACTURERS' RECORD, Baltimore.

INFORMATION WANTED as to eligible location in the South for the establishment of a machine repair shop. Address J. A. S., care MANUFACTURERS' RECORD.

A PRACTICAL FURNITURE MAKER can get an interest in a nice furniture factory located in the healthy town of Athens, East Tennessee, on most favorable terms, as the owner is engaged in other business. But small amount of capital needed. For particulars address J. C. Mansfield, Waco, Texas.

WANTED.—A thorough practical brass moulder, with small capital, to join me in a brass foundry at Chattanooga, (none in the city.) I have the location, buildings, machinery, engine and tools, and am a thorough mechanic unencumbered. Address John A. Lee, 214 Boyce street, Chattanooga.

PARTNER WANTED.—Young man with \$2,000 to \$3,000 to enlarge and improve the best paying hotel and summer resort in the Virginia mountains. Over 200 applicants turned away last season. Fine grove, large grounds on railroad. For particulars, references, &c., address M. H. Bohrer, Liberty, Va.

WANTED.—\$10,000 to patent and manufacture a combined cotton thinner and cultivator, two cultivators, a sugar-cane cutter, a cotton press and a wagon axle—all good devices. A half interest will be given. W. C. Bibb, Atlanta, Ga.

A RARE OPPORTUNITY.—Wanted.—A good business man, mechanic or otherwise, with energy and push, and from \$20,000 to \$25,000 capital, to purchase a half interest in a thriving and prosperous machine works in one of the most important cities in the South. Capital wanted to increase business, having been obliged to decline more contracts during the year than were accepted. No competition in this particular line south of Chicago. Apply to BALTIMORE MANUFACTURERS' RECORD.

WANTED.—Capital to build the Dennis Cotton Worm and Insect Destroyer—patent just allowed—or will sell the patent. It will kill the insects on all farm crops, and at the rate of 20 to 50 acres per day. Address, W. J. Dennis, Augusta, Ga.

WANTED.—By a young Englishman, with some ready cash, which he might invest in the business, a situation as superintendent in a textile factory, wool or cotton, in the South. Is thoroughly conversant with the management of such industries, having been employed in this capacity both in England and this country, and can furnish the highest references as to character and ability. Address Superintendent, care of MANUFACTURERS' RECORD.

WANTED.—\$10,000 to \$15,000 to increase business of a brown freestone quarry. Quarry is opened and working; stone inexhaustible and of quality equal to any in United States; on railroad and near water transportation; profit on quarrying very large. Address C. R. Haskins, Atlanta, Ga.

WANTED.—Capital to manufacture my recent invention—"convertible chair." Simple, practical and serviceable; no tenons, mortising, glued angles or ordinary framing. Every particular given. Address E. H. Lewis, Nashville, Tenn.

WANTED.—By a practical pressed brick maker, capital to manufacture brick in the South. Best place in the United States; brick sell at \$7.00 to \$8.00 per M. No limit to demand. C. B. Chase, Sheffield, Ala.

WANTED.—A practical foundry man, with 4,000 to 5,000 dollars, to take an interest in a machine and boiler works in a Southern city. A splendid opening for the right man. Address, Practical, care Baltimore MANUFACTURERS' RECORD.

WANTED.—Some enterprising company to manufacture and sell patent anti-friction cutting apparatus for mowers and reapers. Can be made and attached to new machines or any second-hand machine now in use. For particulars and description address J. C. V., Box 289, El Paso, Texas.

WANTED.—To correspond with some progressive and energetic young man, who has \$5,000 to \$6,000 at command, and who would wish to engage with the advertiser in the stationary, printing and publishing business in a new and rapidly growing Southern city. No special knowledge of the business necessary. Address, A. B. C., Fredericksburg, Va.

PLANING MILL AND FURNITURE FACTORY.—I have about \$14,000 invested in a well equipped planing mill and furniture factory combined, with patent lumber dryer attached; all run by one (60-horse) steam power; with a good trade already established, and which is being successfully run every day. I have recently accepted a position and taken stock in the Rome Hardware Co., and want to change the investment, and am now offering the entire outfit for \$12,000, upon the following easy terms, to wit: \$2,000 cash, and the balance in ten semi annual payments of \$1,000 each, with 6% interest; or will rent to good party at \$125 per month. For particulars address J. B. Hill, Rome, Ga.

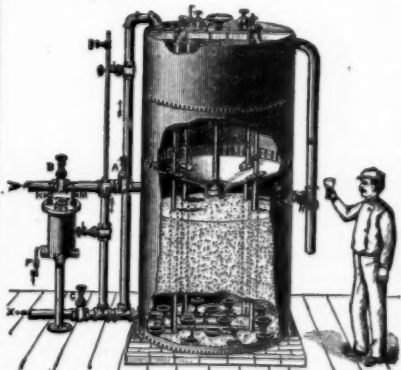
WANTED.—\$2,000 to manufacture printing machinery, a lathe and carriage loader, all new designs, of my own invention. Will give an interest or security. Drawings, etc., will be furnished on application. Mention this paper, and address Taylor Ford, Denison, Texas.

FOR THE BEST
MACHINERY
—FOR—
**SHINGLES,
HEADING AND STAVES,**
And Improved
GAGE LATHES
For
Turning Handles, Etc.
ADDRESS:
TREVOR & CO
LOCKPORT, N. Y.



The HYATT PURE WATER SYSTEM.

Adapting Nature's Process—Endorsed by the Highest Authority.



Cohoes, N. Y.: Hon. Daniel Manning, Albany, N. Y.: Western Steel Works, St. Louis, Mo., and hundreds of others. Representative Agents Wanted. For Circulars, Prices, &c., Address

THE NEWARK FILTERING CO., Tribune Building, NEW YORK.

THE STAR

A Newspaper supporting the Principles of a Democratic Administration.
Published in the City of New York.

WILLIAM DORSHIMER,
EDITOR.

Daily, Weekly, and Sunday Editions.

THE WEEKLY STAR,
An Eight-page Newspaper, issued every Wednesday.

A clean, pure, bright and interesting
FAMILY PAPER.

It contains the latest news, down to the hour of going to press.

Agricultural, Market, Fashion, Household, Financial and Commercial, Political, Poetical, Humorous and Editorial

Departments, all under the direction of trained journalists of the highest ability. Its columns will be found crowded with good things from beginning to end.

Original stories by distinguished American and foreign writers of fiction.

TERMS OF THE WEEKLY STAR TO SUBSCRIBERS.

Free of Postage in the United States and Canada, outside the limits of New York City.

ONE DOLLAR FOR ONE YEAR.

Clubs of 10 to the same P. O. address, with an additional copy to organizer of Club, \$10.00

FOR THREE MONTHS, on trial, 25 cents

Special terms and extraordinary inducements to agents and canvassers. Send for Circulars.

THE DAILY STAR.

THE DAILY STAR contains all the news of the day in an attractive form. Its special correspondence by cable from London, Paris, Berlin, Vienna and Dublin, is a commendable feature.

At Washington, Albany and other news centers, the ablest correspondents, specially retained by THE STAR, furnish the latest news by telegraph.

Its literary features are unsurpassed.

The Financial and Market Reviews are unusually full and complete.

TERMS OF THE DAILY STAR TO SUBSCRIBERS.

Free of Postage in the United States and Canada, outside the limits of New York City.

Every Day, for one year (including Sunday), \$7.00

Daily, without Sunday, one year, 6.00

Every Day, six months, 3.50

Daily, without Sunday, six months, 3.00

Sunday, without Daily, one year, 1.50

Address, **THE STAR,**

Broadway and Park Place, New York.

TO ADVERTISERS!

For a check for \$20 we will print a ten line advertisement in One Million issues of leading American Newspapers and complete the work within ten days. This is at the rate of only one-fifth of a cent a line, for 1,000 Circulation! The advertisement will appear in but a single issue of any paper, and consequently will be placed before One Million different newspaper purchasers;—or FIVE MILLION READERS, if it is true, as is sometimes stated, that every newspaper is looked at by five persons on an average. Ten lines will accommodate about 75 words. Address with copy of Adv. and check, or send 30 cents for Book of 16 pages, GEO. P. ROWELL & CO., 10 SPRUCE ST., NEW YORK.

We have just issued a new edition (the 161st) of our Book called "Newspaper Advertising." It has 176 pages, and among its contents may be named the following Lists and Catalogues of Newspapers:—

DAILY NEWSPAPERS IN NEW YORK CITY, with their Advertising Rates.

DAILY NEWSPAPERS IN CITIES HAVING MORE than 10,000 population, omitting all but the best.

DAILY NEWSPAPERS IN CITIES HAVING MORE than 5,000 population, omitting all but the best.

A SMALL LIST OF NEWSPAPERS IN WHICH to advertise every section of the country; being a choice selection made up with great care, guided by long experience.

ONE NEWSPAPER IN A STATE. The best one for an advertiser to use if he will use but one.

BARGAINS IN ADVERTISING IN DAILY NEWSPAPERS in many principal cities and towns, a List which offers peculiar inducements to some advertisers.

LARGEST CIRCULATIONS. A complete list of all American papers issuing regularly more than 25,000 copies.

THE BEST LIST OF LOCAL NEWSPAPERS, covering every town of over 5,000 population and every important county seat.

SELECT LIST OF LOCAL NEWSPAPERS, in which advertisements are inserted at half price.

5,493 VILLAGE NEWSPAPERS in which advertisements are inserted for \$1 a line and appear in the whole lot—one half of all the American Weeklies.

Send to any address for **THIRTY CENTS.**

FINE
Cut Work
—A—
SPECIALTY
PRINTING
RECORD
Printing House,
Cor. Exchange Place & Commerce St.





BUFFALO HAMMER CO., Buffalo, N. Y., U. S. A., Manufacturers of a full line of
Solid Cast Steel Hammers, Sledges, Mauls,



RAILROAD TRACK TOOLS, &c.

Every Hammer or Tool having our name is fully warranted. Catalogues and discounts sent on application.

BAGNALL & LOUD BLOCK CO. BOSTON, MASS.

Largest Manufacturers of Tackle Blocks in the World.

Manufacturers of the Latest Improved Self-Adjusting ROLLER BUSHED and GENUINE METALINE BUSHED and Iron Bushed Rope and Iron Strapped



Improved Self-Adjusting Roller Bushed Iron Sheave.

TACKLE BLOCKS.

Send for the Celebrated
STAR BRAND.

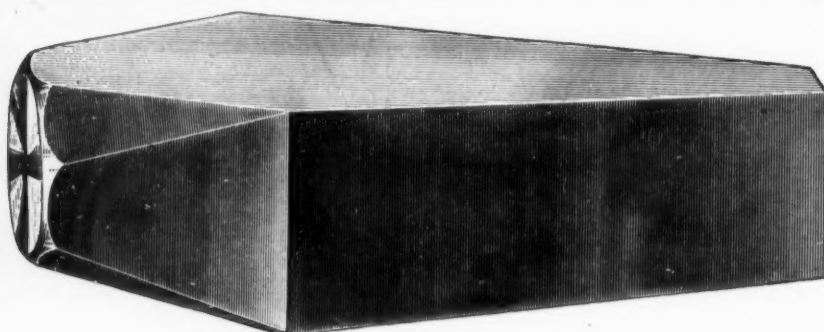


Improved Harcourt Patent Block.

Send for Catalogue
 No. 5.



Improved Self-Locking Link Snatch Block.



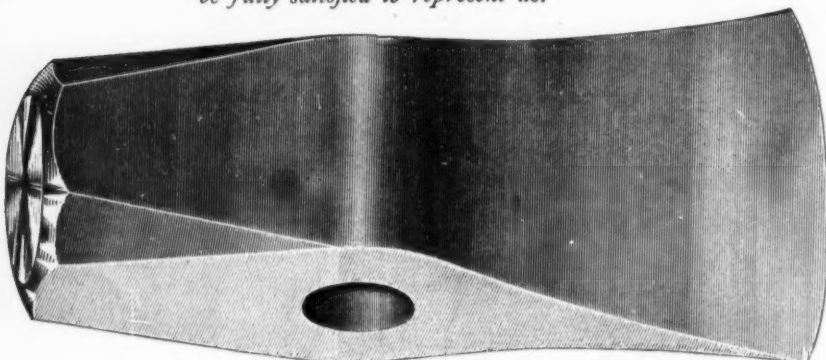
Stone Wedge.

TO THE TRADE:

It Will Pay You to Handle Our Goods.

They are the Best Made, and at the
 same time **CHEAP** and **VERY SALABLE.**

Send a sample order, no matter how small it is, and you will
 be fully satisfied to represent us.

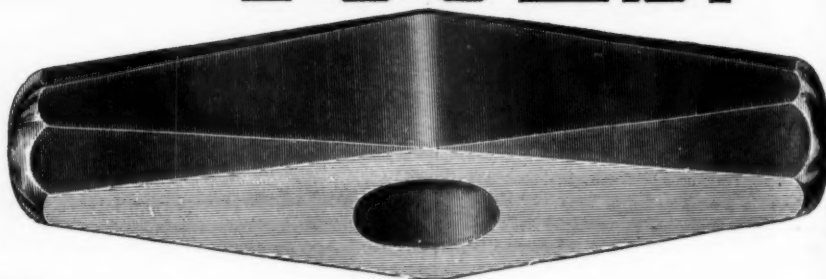


Wood-Chopper's Maul.

**WESTERN FORGE & TOOL WORKS,
 ST. LOUIS, MO.**

HEADQUARTERS FOR

Quarry, Miners', Railroad and Blacksmiths'
TOOLS.



Welding Hammer.

MINERS, QUARRYMEN, BLACKSMITHS and OTHERS,
 Remember "The Best is always the Cheapest."

ASK FOR TOOLS MADE BY THE

WESTERN FORGE & TOOL CO.

ALL WARRANTED.

Catalogues upon Application.

Vehicle Spring Co., MANUFACTURERS PAT. WAGON SPRINGS & WAGON SEAT SPRINGS, CHATTANOOGA, TENN.

Wagon
 Seat
 Spring.



The same Wagon can be used as an Express and Lumber Wagon. You can raise the end of your Wagon bed and put the Springs on or off at pleasure.

The hooks that fit the side of the Wagon bed are a part of the Spring, making the lightest, the most comfortable, and the strongest Spring on the market. These are a great improvement on the old style seat Spring.

VEHICLE SPRING CO.,

Gentlemen: After having tried your Springs, both Bolster and Seat, we cordially endorse them as being in all respects the BEST and CHEAPEST now on the market, and heartily commend them for general use. Very respectfully, &c.,

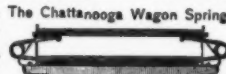
VANCE & KIRBY, J. H. WARNER & Co., Wholesale Hardware and Wagons.

DEMENT, BAIRD & Co., C. AULTMAN & Co., CHAS. W. BIERSE, Farm Implements and Wagons.

Address for further information

ATTENTION, DEALERS!
 A liberal discount to the trade.

VEHICLE SPRING CO., Chattanooga, Tenn.



The Chattanooga Wagon Spring



Blaine's Patent.

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The York Ice and Refrigerating Machines York Mfg. Co.
 YORK, PA.

The Manufacturers' Record

is the most thorough, complete and authentic source of information on Southern industrial affairs in existence. The subscription price is only \$3.00 a year. Some of our subscribers think every issue is worth that much. Try it for a year. Send in your subscription to-day. Don't wait until to-morrow; you may forget it.

→ HARDWARE. ←

Baltimore WHOLESALE Prices.

ANVILS.	
Eagle and Vulcan.....	10 c. dis 20%
Wright's.....	9 1/2 c
Armstrong's Mouse Hole.....	9c
Trenton.....	10c
Wilkinson's.....	10 1/2 c

AUGERS AND BITS.	
Conn. Valley Mfg. Co.....	extra, 60c to 1 1/2
Douglas Mfg. Co.....	No. 1, 60c to 85 c
Ives.....	
Cook's Douglas Mfg. Co.....	dis 55c to 1 1/2
Grissold.....	dis 50c to 1 1/2
Patent Solid Head.....	dis 25 c
Russell Jennings' Auger, Dowell, Machine.....	dis 10c to 1 1/2
Dowell and Hand Rail Bits.....	dis 40c to 1 1/2
Ives' "Jennings" Bits.....	dis 40c to 1 1/2
Expansive Bits, Clark's small, 1 1/2; large, 2.....	dis 25c to 1 1/2
Expansive Bits, Ives.....	dis 45 c
Expansive Bits Blake's.....	dis 45 c
Hollow Augers, Ives.....	dis 25 c
Hollow Augers, Douglas.....	dis 25c to 1 1/2
Hol. Aug., Bonney's Adjust., 1/2 doz 1 1/2, dis 40 c	
Hol. Aug., Stearns' Adjust., 1/2 doz 1 1/2, dis 20c to 1 1/2	
Hol. Aug., Ives' Expansive, each 1 1/2, dis 25c to 1 1/2	
Hol. Aug., Universal Expansive, each 1 1/2, dis 20 c	
Wood's.....	dis 25 c
Gimlet Bits.....	dis 50 c
Gimlet Bits, Diamond.....	dis 50 c
Double Cut Gimlet Bits.....	dis 40 c
Double Cut Gimlet Bits, Douglas.....	dis 40 c
Double Cut Gimlet Bits, Ives.....	dis 50 c
Morse's Bit Stock Drill.....	dis 50 c
L'Hommedieu's Ship Augers.....	dis 15 c

AWL HATS.	
Sewing Brass Ferrule.....	dis 40c to 1 1/2
Patent Sewing, Short.....	dis 40c to 1 1/2
Patent Sewing, Long.....	dis 40c to 1 1/2
Patent Peg, Plain Top.....	dis 45c to 1 1/2
Patent Peg, Leather Top.....	dis 45c to 1 1/2

AXES.	
Collins & Co.....	\$7.00; beveled..\$7.25
Lippincott or Mann's.	
Single Bit, $\frac{1}{4}$ to $\frac{3}{4}$ and under.....	doz. \$6.50 net
Single Bit, $\frac{3}{4}$ to 6 and over.....	doz. \$7.00 net
Single Bit, beveled.....	doz. advance
Double Bit, $\frac{1}{4}$ to $\frac{3}{4}$ and under.....	doz. \$12.00 net
Double Bit, $\frac{3}{4}$ to 6 and over.....	doz. \$13.00 net
Double Bit, beveled.....	doz. advance
Second quality Axes.....	50 cts. less than above

Crown, single action, 3 quart, \$3.75; 3 quart, \$4.50; 4 quart, \$5.50; 6 quart, \$7; 8 quart, \$8.50; 10 quart, \$11; 14 quart, \$14.50. dis 60 %
Crown, double action, with crank, 3 quart, \$5.50; 4 quart, \$6.50; 6 quart, \$8.50; 8 quart, \$10; 10 quart, \$12; 14 quart, \$16.50; 18 quart, \$21; 24 quart, \$28. With fly wheel, 3 quart, \$6; 4 quart, \$7; 6 quart, \$9; 8 quart, \$10.50; 10 quart, \$12.50; 14 quart, \$17; 18 quart, \$21.50; 24 quart, \$29. dis 60 %
Star, double action, 3 quart, \$3.75; 3 quart, \$4.50; 4 quart, \$5.50; 6 quart, \$7; 8 quart, \$8.50; 10 quart, \$11; 14 quart, \$14.50. dis 60 %
Gem, double action, 3 quart, \$3.75; 3 quart, \$4.50; 4 quart, \$5.50; 6 quart, \$7; 8 quart, \$8.50; 10 quart, \$11; 14 quart, \$14.50. dis 60 %
Crown Ice Chopper..... dis 35 %

KNOS.
Carriage, (Jap'd 80 c gross)..... dis 60 %
Base-Common..... dis 30 %
Hemlock Pine Knobs..... new list, dis 10 %
Door Mineral.....
Door Por. Jap'd..... Same discounts as Door Locks.
Door Por. Plated.....
Door Por.....
Furniture Plain..... 75c gross inch, dis 10 %
Furniture Wood Screws..... dis 25 %
Picture..... dis 60 %
Hemlock, Picture..... dis 35 %
Shutter, Porcelain..... dis 65 %

LADLES.
Melting & Skim'ng, Monroe's Pat. dis 45 %
Melting, C & C..... dis 30 %

LAWN MOWERS.
Acme Buckeye, Easy & Excelsior, new list, dis 40 %

LINES.
Wire Fish..... dis 50 %
Wire Clothes, Galvanized, 100 feet..... dis 30 %

LOCKS AND LATCHES.
Cabinet, Eagle..... Changes made in list price
Cabinet, Caylord..... of some numbers Jan. 1,
Cabinet, Bridgeport..... 1881, dis 25 %
Cabinet, P. & F. Corbin..... dis 40 %
Trunk, new list, Jan 1, 1881..... dis 15 %
Yale Lock Co., Flat Key..... dis 40 %
Plate..... dis 35 %

DOOR LOCKS, ETC.
Bradford.....
Norwalk.....
Norwich.....
P. & F. Corbin.....
Russell & Erwin.....
Mallory, Wheeler & Co.....
Nimick & Brittan Mfg. Co.....
Padlocks-Russell & Erwin.....
Mallory, Wheeler & Co.....
Norwich Lock Manf. Co.....
Wm. Wilcox & Co.....
Nimick & Brittan Mfg. Co.....
Wm. Wilcox & Co's Plate Locks.....
Yale Lock Manf. Co's "Standard".....
Romer's.....
Conestoga.....
Scandinavian, "Norwich".....
Nimick & Brittan's Burglar-Proof Locks.....

List prices as revised
Dec. 18th, 45 & 50 %
for cash.

dis 75 %
and 25 % for cash.

dis 35 % & 25 %

dis 40 %

dis 25 % & 40 %

dis 80 % & 10 %

dis 50 %

dis 50 %

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RATE.
Sliding Door, Wrought Brass..... dis 35 %
Sliding Door, Bronzed Wrt. Iron..... dis 35 %
Sliding Door, Iron, Painted..... dis 35 %
Barn Door..... dis 35 %
Per 100 feet, \$2.50 3.00 4.40 dis 10 %
B. D. for N. E. Hangers.....

RIVETS.
Small. Med. Large.
Per 100 feet..... \$2.15 2.70 3.25 net.

RODS.
Iron and Tinned, new list, Dec. 10, 1881..... dis 50 %
In bulk, new list, Dec. 10, 1881..... dis 45 %
Copper Rivets and Burrs..... dis 60 %
Nos. 7 8 9 10 11 12 13 14 15
Wt. 45c. 50c. 55c. 58c. 58c. 60c. 65c. 70c.
Rivet Sets..... dis 50 %

RULES.
Boxwood. Ivory.
Chapin's..... dis 80 %
Standard..... dis 50 %
Stanley..... dis 50 %
Stevens & Co..... dis 50 %
Stevens & Co. Miscellaneous..... dis 50 %

SAD IRONS.
Self-Heating, Charcoal..... dis 9.00 net
Mrs. Pott's Irons..... dis 35 %
Enterprise Star Irons, new list, July 20, '82..... dis 35 %
Comb'd Fluter and Sad Iron..... dis 15 %
Common Sad Irons..... dis 25 %

SAND PAPER.
Baeder & Adamson's Flint, 0000..... \$4.50 r'm.
Baeder & Adamson's Flint, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

STAIR, BRASS..... dis 25 %

STAIR, BLACK WALNUT..... 50c. doz.—net

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SCREWS.	
Standard new list, Feb. 15.	
Flat Head Bright.....	75 %
Round Head Blue.....	70 %
Round Head Bright.....	70 %
Flat Head Brass.....	75 %
Round Head Brass.....	70 %
Flat Head Blue (add 5 % to net).....	80 %
Continental Flat Head.....	85 %
Brass and Silver Capped.....	40 %
Japanned Flat Head.....	70 & 10 %
Coach, Patent Gimlet Point.....	dis 75 %
Coach, Common or Lag.....	dis 70 & 10 %
Bed.....	dis 25 %
Machine, Flat Head, Iron.....	dis 60 %
Machine, Round Head, Iron.....	dis 55 %
Bench, Iron.....	dis 55 & 10 %
Bench, Wood, Beach.....	dis 25 %
Bench, Wood, Hickory.....	dis 20 & 10 %
Hand, Wood.....	dis 25 & 10 %
Hand Rail, Sargent's.....	dis 60 & 10 %
Hand Rail, Humason, Beckley & Co.'s.....	dis 40 & 10 %
Hand Rail, Am. Screw Co., list Jan. 1, '81.....	dis 70 %
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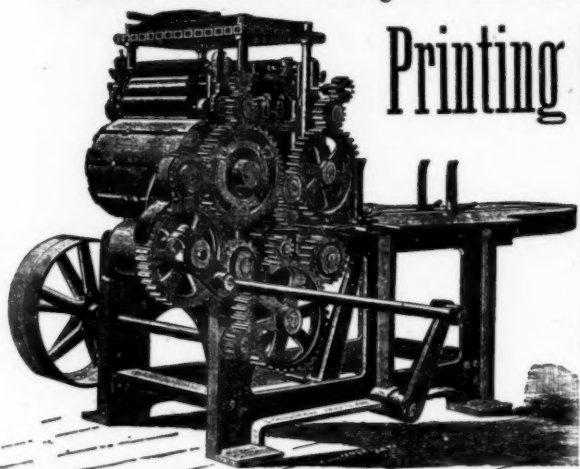
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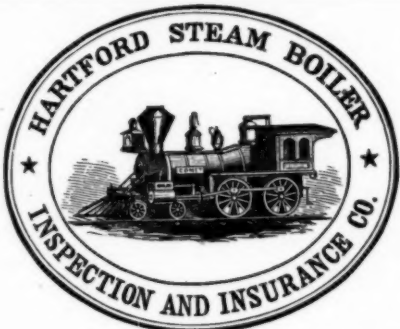


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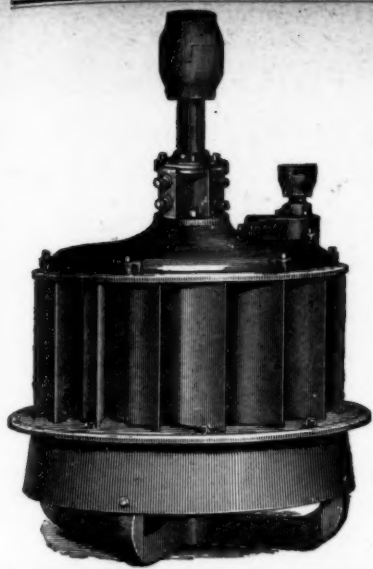
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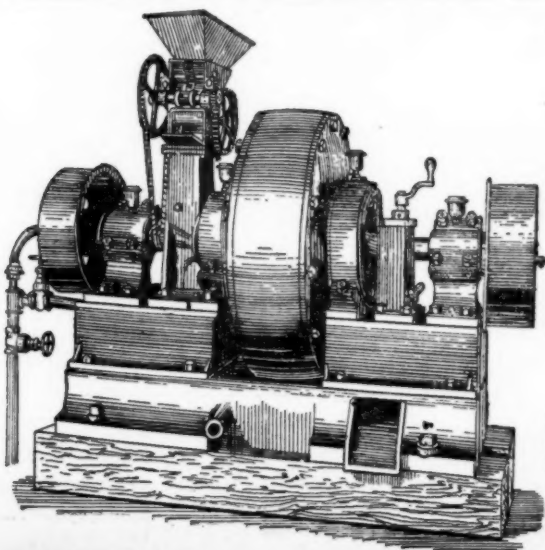
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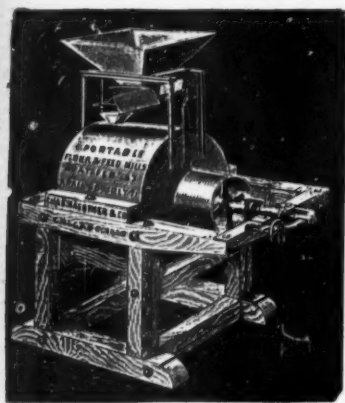
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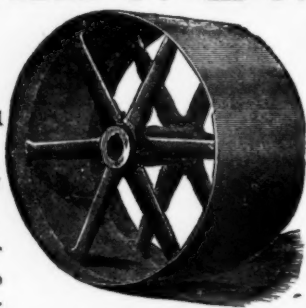
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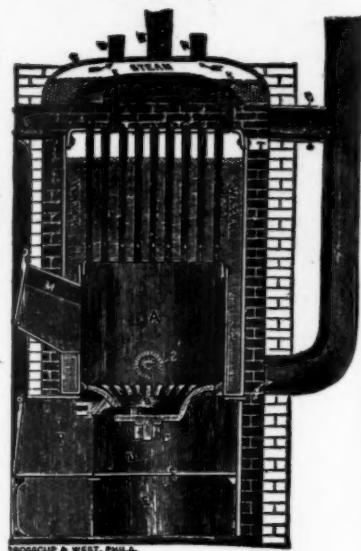
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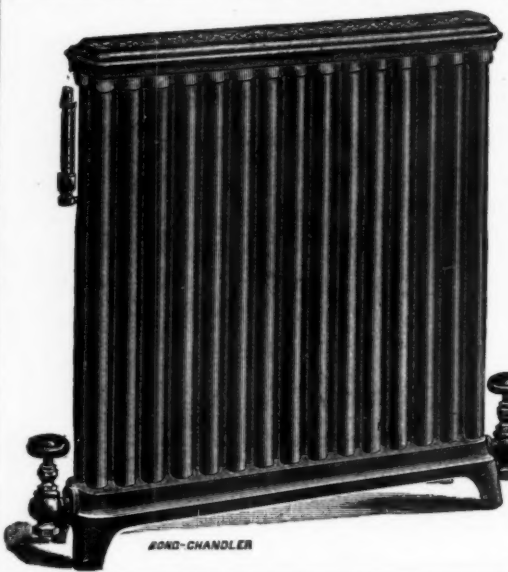
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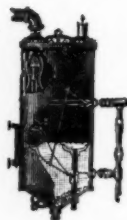
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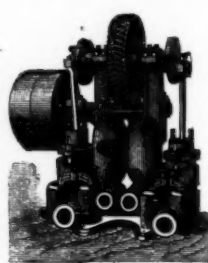
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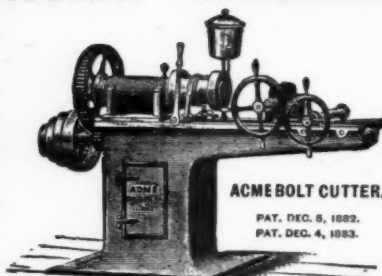
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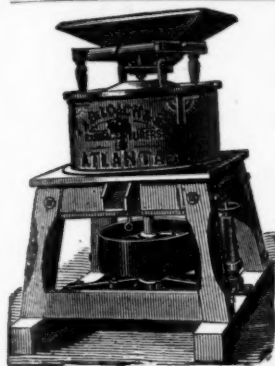
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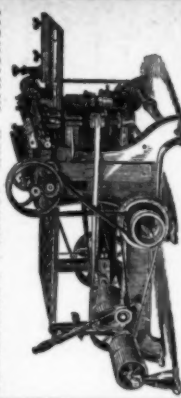
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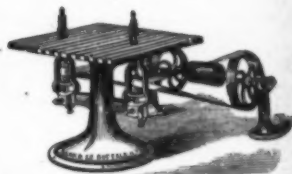
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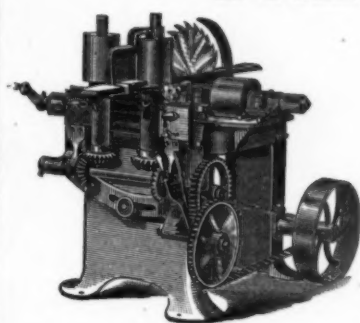
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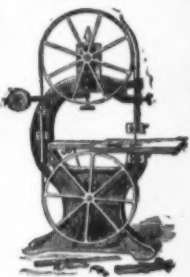
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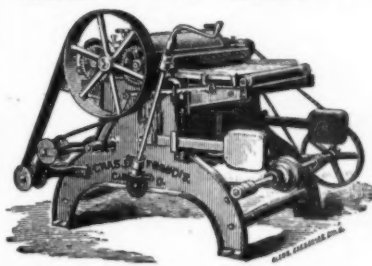
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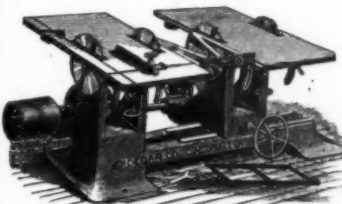
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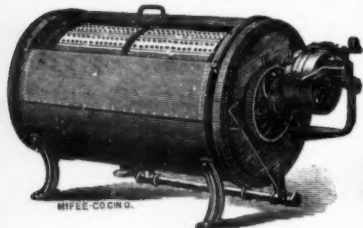
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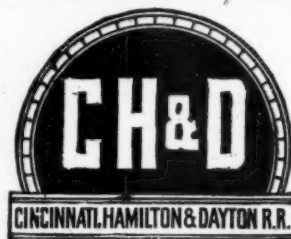
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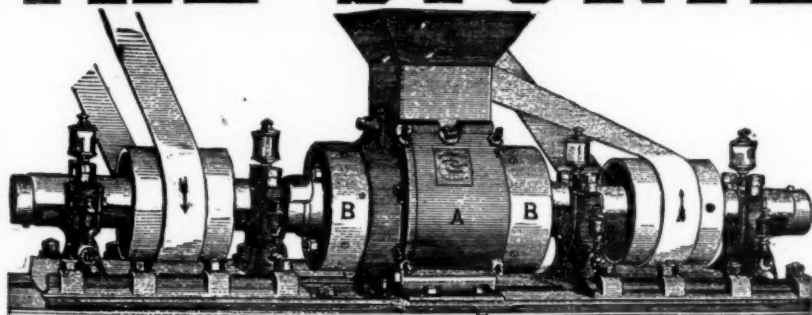
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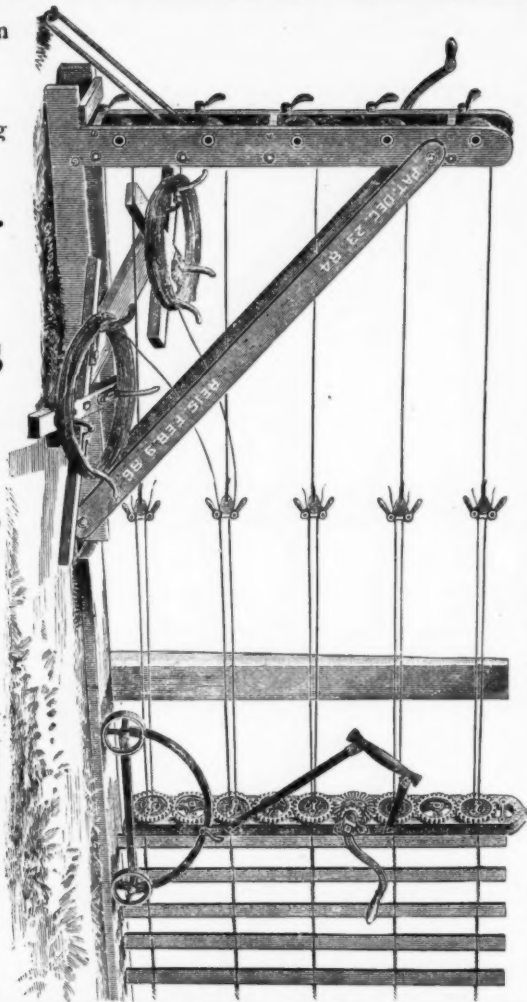
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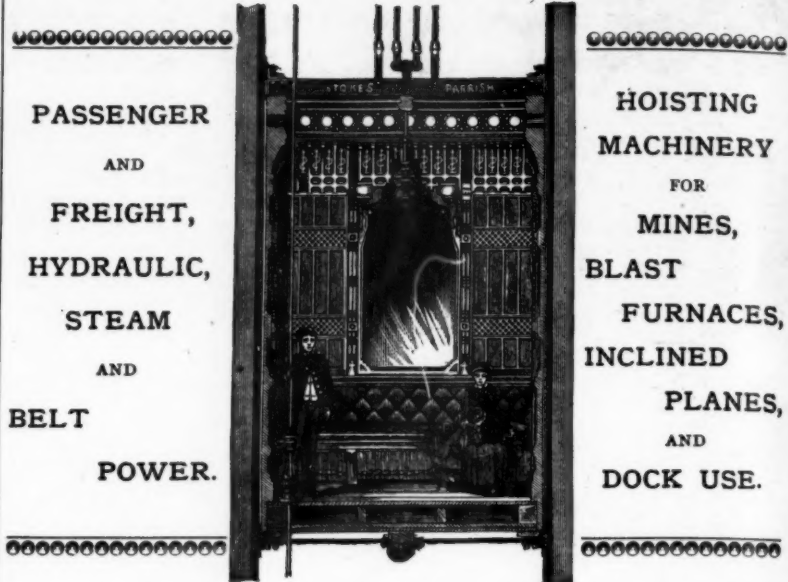
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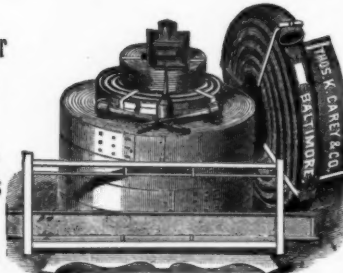
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